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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION WORK PLAN SUPPLEMENTAL SAMPLING PLAN ADDENDUM 5 GROUP 3 SOLID WASTE MANAGEMENT UNITS 20, 21, 29, 46 AND 52 NS MAYPORT FL

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RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY INVESTIGATION (RFI) WORKPLAN SUPPLEMENTAL SAMPLING PLAN ADDENDUM 5

GROUP III
SOLID WASTE MANAGEMENT UNITS

U.S. NAVAL STATION MAYPORT
MAYPORT, FLORIDA

UNIT IDENTIFICATION CODE NO. N60201
CONTRACT NO. N62467-89-D-0317

NOVEMBER 1994

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010

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RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
FACILITY INVESTIGATION (RFI) WORKPLAN
SUPPLEMENTAL SAMPLING PLAN
ADDENDUM 5

GROUP III
SOLID WASTE MANAGEMENT UNITS

U.S. NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Unit Identification Code (UIC): N60201

Contract No. N62467-89-D-0317

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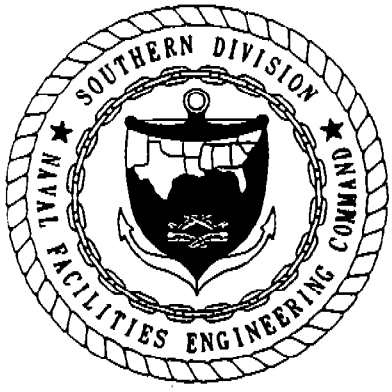
November 1994



FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense (DOD) initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). The acts, passed by Congress in 1980 and 1986, respectively, establish the means to assess and clean up hazardous waste sites for both private-sector and Federal facilities. These acts are the basis for what is commonly known as the Superfund program.

Originally, the Navy's part of this program was called the Naval Assessment and Control of Installation Pollutants (NACIP) program. Early reports reflect the NACIP process and terminology. The Navy eventually adopted the program structure and terminology of the standard IR program.

The IR program is conducted in several stages as follows.

- The Preliminary Assessment (PA) identifies potential sites through record searches and interviews.
- A Site Inspection (SI) then confirms which areas contain contamination, constituting actual "sites." (Together, the PA and SI steps were called the Initial Assessment Study (IAS) under the NACIP program.)
- Next, the Remedial Investigation and the Feasibility Study (RI/FS) together determine the type and extent of contamination, establish criteria for cleanup, and identify and evaluate any necessary remedial action alternatives and their costs. As part of the RI/FS, a Risk Assessment identifies potential effects on human health or the environment to help evaluate remedial action alternatives.

- The selected alternative is planned and conducted in the Remedial Design and Remedial Action Stages. Monitoring then ensures the effectiveness of the effort.

A second program to address present hazardous material management is the Resource Conservation and Recovery Act (RCRA). RCRA ensures that solid and hazardous wastes are managed in an environmentally sound manner. The law applies to facilities generating or handling hazardous waste. The RCRA corrective action program is designed to identify and clean up releases of hazardous substances at RCRA-permitted facilities.

The RCRA program is conducted in three stages as follows.

- The RCRA Facility Assessment (RFA) (Confirmatory Sampling) identifies solid waste management units (SWMUs), evaluates the potential for releases of contaminants, and determines the need for future investigations.

- The RCRA Facility Investigation (RFI) then determines the nature, extent, and fate of contaminant releases.

- The Corrective Measures Study (CMS) identifies and recommends measures to correct the release.

The hazardous waste investigations at U.S. Naval Station (NAVSTA) Mayport are presently being conducted under the RCRA corrective action program. Earlier preliminary investigations had been conducted at NAVSTA Mayport under the NACIP program and IR program following Superfund guidelines. In 1988, in coordination with the U.S. Environmental Protection Agency (USEPA) and the Florida Department of Environmental Regulation (FDER), the hazardous waste investigations were formalized under the RCRA program.

NAVSTA Mayport is conducting the cleanup at their facility by working though the Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). The USEPA and the Florida Department of Environmental Protection (FDEP; formerly FDER) oversee the Navy environmental program at NAVSTA Mayport. All aspects of the program are conducted in compliance with State and Federal regulations, as ensured by the participation of these regulatory agencies.

Questions regarding the RCRA program at NAVSTA Mayport should be addressed to Mr. David Driggers, Code 1852, at (803) 743-0501.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES), has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to conduct a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Units (SWMUs) at U.S. Naval Station (NAVSTA) Mayport, Mayport Florida. The RFI is being conducted in accordance with the Hazardous and Solid Waste Amendment (HSWA) permit No. FL9 170 024 260, issued by the U.S. Environmental Protection Agency (USEPA) on March 25, 1988, and revised and reissued on June 15, 1993.

The HSWA permit identified 18 SWMUs as requiring an RFI. The purpose of the RFI is to provide the information necessary to conduct a health and ecological assessment and to design corrective measures, if required, for each of the SWMUs identified as requiring an RFI. An RFI workplan that addresses the Group I, II and III SWMUs was reviewed and accepted by the USEPA and the Florida Department of Environmental Protection (FDEP) in 1991. Subsequent revisions were made by submitting workplan addenda to the Navy, USEPA, and FDEP. Previously four addenda to the 1991 RFI workplan were prepared, including:

- Addendum 1, Investigation Derived Waste Management Plan;
- Addendum 2, Phase 2 Background Sampling and Analysis Plan;
- Addendum 3, Light Nonaqueous Phase Liquid (LNAPL) Sampling and Analysis Plan; and
- Addendum 4, Supplemental Sampling Plan, Groups I and II SWMUs.

Addendum 5 to the RFI workplan is prepared to address the sampling activities at the Group III SWMUs in accordance with the RCRA corrective action program at NAVSTA Mayport as described in the Corrective Action Management Plan (CAMP). The CAMP is presented in Appendix F of Volume I of the RFI workplan (ABB-ES, 1991). A revised CAMP was submitted for regulatory approval in May 1994 (ABB-ES, 1994b). The Group III SWMUs identified in the HSWA permit as requiring an RFI consist of the following:

- SWMU 1, Landfill A;
- SWMU 14, Mercury/Oily Waste Spill Area; and
- SWMU 17, Carbonaceous Fuel Boiler.

Six of the Group III SWMUs identified in the HSWA permit as requiring confirmatory sampling also are being addressed in this RFI workplan as follows:

- SWMU 18, Fleet Training Center (FTC) Diesel Generator Sump;
- SWMU 23, Jacksonville Shipyard, Inc. (JSI), Area;
- SWMU 24, North Florida Shipyard, Inc. (NFSI), Area;
- SWMU 25, Atlantic Marine, Inc. (AMI), Area;
- SWMU 44, Wastewater Clarifiers 1 and 2; and
- SWMU 45, Wastewater Treatment Facility Sludge Drying Beds.

The SWMUs listed above are being assessed with and included in the Group III RFI workplan for the following reasons. SWMU 18 is located adjacent to SWMU 14, Mercury/Oil Waste Spill Area, and shares a similar hydrogeologic setting and similar petroleum-related contamination. SWMUs 23, 24, 25, 44, and 45 are

adjacent to SWMU 1, Landfill A, and share a similar hydrogeologic setting and may have some similar contaminants.

The following Group III SWMUs also require confirmatory sampling but are being addressed separately in an RCRA Facility Assessment Sampling Visit (RFA/SV) workplan.

- SWMU 20, Hobby Shop Drain;
- SWMU 21, Hobby Shop Scrap Storage Area;
- SWMU 29, Oily Waste Pipeline Break;
- SWMU 46, Shore Intermediate Maintenance Activity (SIMA) Engine Drain Sump; and
- SWMU 52, Public Works Department (PWD) Service Station Storage Area.

Release of contaminants from SWMUs 20, 21, and 52 to the environment is suspected but not confirmed. A release of petroleum-related contaminants at SWMUs 29 and 46 has been confirmed and is being assessed under State of Florida underground storage tank regulations. The purpose of RFA/SV sampling activities is to confirm whether or not contaminant releases have occurred and to determine whether no further action is appropriate or an RFI should be conducted.

Addendum 5 to the RFI workplan presents historical information for Group III SWMUs, analytical results of environmental samples collected during previous investigations, and sampling locations and rationale required to complete the characterization of contaminants and human health and ecological risk assessments at the SWMUs.

This RFI workplan addendum proposes locations to collect environmental samples from suspected affected media (sediment, surface water, soil, groundwater, and sludge) and analytical methods to characterize releases of contaminants to the environment. The analytical methods will address selected contaminants listed in the 40 Code of Federal Regulations, Part 264, Appendix IX, Groundwater Monitoring List. Analytical methods will include USEPA Method 8240 for volatile organic compounds, USEPA Method 8270 for semivolatile organic compounds, USEPA Method 8080 for chlorinated pesticides and polychlorinated biphenyls, and USEPA Methods 6010, 7420, and 7470 for metals.

TABLE OF CONTENTS

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Chapter	Title	Page No.
1.0	INTRODUCTION	1-1
	1.1 PURPOSE	1-4
	1.2 SCOPE	1-4
	1.3 ENVIRONMENTAL SETTING	1-5
	1.3.1 Physiography and Topography	1-5
	1.3.2 Hydrology	1-8
	1.3.3 Geology	1-8
	1.3.4 Hydrogeology	1-16
2.0	PREVIOUS INVESTIGATIONS	2-1
	2.1 INITIAL ASSESSMENT STUDY (IAS)	2-1
	2.2 EXPANDED SITE INVESTIGATION (ESI)	2-1
	2.3 RCRA FACILITY ASSESSMENT (RFA)	2-2
	2.4 BACKGROUND CHARACTERIZATION	2-2
	3.1 SWMUs 1, 23, 24, 25, 44, AND 45	3-1
	3.1.1 Site Descriptions	3-1
	3.1.2 Summary of Previous Investigations	3-10
	3.1.3 Rationale for Sampling Activities	3-18
	3.2 SWMUs 14 and 18	3-32
	3.2.1 Site Descriptions	3-32
	3.2.2 Summary of Previous Investigations at SWMUs 14 and 18	3-39
	3.2.3 Rationale for Sampling Activities at SWMUs 14 and 18	3-39
	3.3 SWMU 17	3-44
	3.3.1 Site Description of SWMU 17	3-44
	3.3.2 Summary of Previous Investigations at SWMU 17	3-46
	3.3.3 Rationale for Sampling Activities at SWMU 17	3-46
4.0	ANALYTICAL PROGRAM	4-1
5.0	QUALITY ASSURANCE AND QUALITY CONTROL	5-1
6.0	HEALTH AND SAFETY	6-1
7.0	SCHEDULE	7-1

REFERENCES

APPENDIX A: Photographs
APPENDIX B: Fly Ash Extraction Procedure Toxicity Analytical Data
APPENDIX C: Response to FDEP Comments on Draft Workplan

LIST OF FIGURES

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Figure	Title	Page No.
1-1	Facility Location Map	1-2
1-2	Solid Waste Management Units (SWMUs) Within Corresponding Group Areas	1-3
1-3	Previous Land Features, Shorelines, and Environments	1-6
1-4	Previous Land Features, History of Dredge Fill and Land Use	1-7
1-5	Location Map for Lithologic Cross Sections	1-9
1-6	Key to Lithologic Symbols	1-10
1-7	Cross Section A-A', Group I and Group II SWMUs	1-11
1-8	Cross Section B-B', Group I SWMUs	1-12
1-9	Cross Section C-C', Group II SWMUs	1-13
1-10	Cross Section D-D', Group II SWMUs	1-14
1-11	Cross Section E-E', Group III SWMUs	1-15
3-1	Potential Locations of Landfill A	3-3
3-2	SWMU 23, Jacksonville Shipyard, Inc.	3-4
3-3	Areas of Potential Contamination	3-6
3-4	SWMU 24, North Florida Shipyard, Inc., and SWMU 25, Atlantic Marine, Inc.	3-7
3-5	SWMUs 1, 23, 24, 25, 44, and 45, Areas of Potential Contamination	3-9
3-6	NAVSTA Mayport Wastewater Treatment Plant, and SWMUs 44 and 45	3-11
3-7	Wastewater Treatment Facility Process Flow Diagram	3-12
3-8	Expanded Site Investigation, SWMU 1 Landfill	3-14
3-9	Former Jacksonville Shipyard Administration Building and Surrounding Area	3-15
3-10	Surface and Subsurface Soil Sampling Locations	3-19
3-11	Proposed Geophysical Survey Grid and TerraProbe℠ Sampling Locations	3-23
3-12	SWMUs 1, 23, 24, 25, 44, and 45, Proposed Surface Soil and Composite Surface and Subsurface Soil Sample Locations	3-26
3-13	SWMUs 1, 23, 24, 25, 44, and 45, Existing and Proposed Monitoring Well Locations	3-27
3-14	Typical Monitoring Well Construction Diagram, Shallow Zone, Surficial Aquifer	3-29
3-15	Typical Monitoring Well Construction Diagram, Intermediate Zone, Surficial Aquifer	3-30
3-16	Typical Monitoring Well Construction Diagram, Deep Zone, Surficial Aquifer or Hawthorn Group	3-31
3-17	SWMUs 14 and 18, Potential Sources of Contamination	3-33
3-18	Fire-fighting Training Area and Drainage System in 1964	3-35
3-19	Fire-fighting Training Area and Drainage System in 1977	3-36
3-20	Fire-fighting Training Area and Drainage System in 1994	3-38
3-21	SWMUs 14 and 18 Proposed TerraProbe℠, Surface Soil, Subsurface Soil, Sediment and Groundwater Locations	3-41
3-22	Site Map and Surface Soil Sample Locations, SWMU 17, Carbonaceous Fuel Boiler	3-45
7-1	Project Schedule	7-2

LIST OF TABLES

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Table	Title	Page No.
2-1	Summary of Background Soil Screening Values	2-3
2-2	Summary of Sediment Screening Values	2-4
2-3	Summary of Background Surface Water Screening Values	2-5
2-4	Summary of Background Groundwater Screening Values	2-6
3-1	Analytical Results for Surface Soil Samples, Jacksonville Shipyard Administration Building Area	3-16
3-2	Analytical Results for Subsurface Soil Samples, Jacksonville Shipyard Administration Building Area	3-17
3-3	Analytical Results for Surface Soil Samples, December 1993, Jacksonville Shipyard Administration Building Area	3-20
3-4	Summary of Environmental and Quality Control Samples by Medium	3-21
3-5	Summary of Environmental Samples by Analytical Parameters	3-22
4-1	Gas Chromatograph amd Mass Spectrometer Volatiles Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List	4-2
4-2	Gas Chromatograph and Mass Spectrometer Semivolatiles Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List	4-4
4-3	Gas Chromatograph Pesticides, Herbicides and Polychlorinated Biphenyls Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List	4-8
4-4	Inorganics and Cyanide Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Analyte List	4-10

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
AFFF	aqueous film forming foam
AMI	Atlantic Marine, Inc.
AOCs	Areas of Concern
bls	below land surface
CAMP	Corrective Action Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPC	contaminants of potential concern
CVAA	cold vapor atomic absorption
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DQOs	data quality objectives
EP Tox	extraction procedure toxicity test
ESI	Expanded Site Investigation
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FFT	FTC Firefighting Training
FTC	Fleet Training Center
ft/ft	feet per foot
GC	gas chromatograph
GC/MS	gas chromatography and mass spectroscopy
GFAA	graphite furnance atomic absorption
HASP	Health and Safety Plan
HEA	Health and Environmental Assessment
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
ICP	inductively coupled plasma
IDL	instrument detection limit
IR	Installation Restoration
JSI	Jacksonville Shipyard, Inc.
LNAPL	light non-aqueous phase liquid
mgd	million gallons per day
mg/ℓ	milligrams per liter
mg/kg	milligrams per kilogram
msl	mean sea level
µg/kg	micrograms per kilogram
µg/ℓ	micrograms per liter

NACIP	Naval Assessment and Control of Installation Pollutants
NAVSTA	Naval Station
NEESA	Naval Energy and Environmental Support Activity
NFSI	North Florida Shipyard, Inc.
NPDES	National Pollutant Discharge Elimination System
NTUs	nephelometric turbidity units
OVA	organic vapor analyzer
OWTP	Oily Waste Treatment Plant
PCB	polychlorinated biphenyl
PWD	Public Works Department
QA/QC	quality assurance and quality control
QAP	Quality Assurance Plan
QAPP	Quality Assurance Program Plan
RCRA	Resource Conservation and Recovery Act
RFA	Resource Conservation and Recovery Act Facility Assessment
RFA/SV	RFA/Sampling Visit
RFI	Resource Conservation and Recovery Act Facility Investigation
SIMA	Shore Intermedial Maintenance Activity
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SVOC	semivolatile organic compound
SUPSHIPs	Supervisor of Shipbuilding
SWMU	Solid Waste Management Unit
TAL	target analyte list
TCL	target compound list
TDS	total dissolved solids
USCS	Unified Soil Classification System
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
VSI	Visual Site Inspection
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (SOUTHNAV-FACENGCOM) to conduct a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Units (SWMUs) at U.S. Naval Station (NAVSTA) Mayport, Mayport Florida (Figure 1-1). The RFI is being conducted in accordance with the Hazardous and Solid Waste Amendment (HSWA) permit No. FL9 170 024 260, issued by the U.S. Environmental Protection Agency (USEPA) on March 25, 1988, and revised and reissued on June 15, 1993.

The HSWA permit identified 18 SWMUs as requiring an RFI. The purpose of the RFI is to provide the information necessary to conduct a health and ecological assessment and to design corrective measures, if required, for each of the SWMUs identified as requiring an RFI. An RFI workplan (ABB-ES, 1991) that addresses the Group I, II, and III SWMUs was reviewed and accepted by the USEPA and the Florida Department of Environmental Protection (FDEP) in 1991. Subsequent revisions were made by submitting workplan addenda to the Navy, USEPA, and FDEP. Four previous addenda to the 1991 RFI workplan have been prepared, including:

- Addendum 1, Investigation Derived Waste Management Plan;
- Addendum 2, Phase 2 Background Sampling and Analysis Plan;
- Addendum 3, Light Nonaqueous Phase Liquid (LNAPL) Sampling and Analysis Plan; and
- Addendum 4, Supplemental Sampling Plan, Groups I and II SWMUs.

Addendum 5 to the RFI workplan is prepared to address the sampling activities at the Group III SWMUs in accordance with the RCRA corrective action program at NAVSTA Mayport as described in the Corrective Action Management Plan (CAMP). The CAMP is located in Appendix F of Volume I of the RFI workplan (ABB-ES, 1991). A revised CAMP was submitted for regulatory approval in May 1994 (ABB-ES, 1994b). The Group III SWMUs identified in the permit as requiring an RFI consist of the following (Figure 1-2):

- SWMU 1, Landfill A;
- SWMU 14, Mercury/Oily Waste Spill Area; and
- SWMU 17, Carbonaceous Fuel Boiler.

Six of the SWMUs identified in the permit as requiring confirmatory sampling are also addressed in this RFI Workplan as follows (Figure 1-2):

- SWMU 18, Fleet Training Center (FTC) Diesel Generator Sump;
- SWMU 23, Jacksonville Shipyard, Inc. (JSI), Area;
- SWMU 24, North Florida Shipyard, Inc. (NFSI), Area;
- SWMU 25, Atlantic Marine, Inc. (AMI), Area;
- SWMU 44, Wastewater Clarifiers 1 and 2; and
- SWMU 45, Wastewater Treatment Facility Sludge Drying Beds.

The SWMUs listed above are included in the Group III RFI workplan for the following reasons. SWMU 18 is located adjacent to RFI SWMU 14, Mercury/Oil Waste

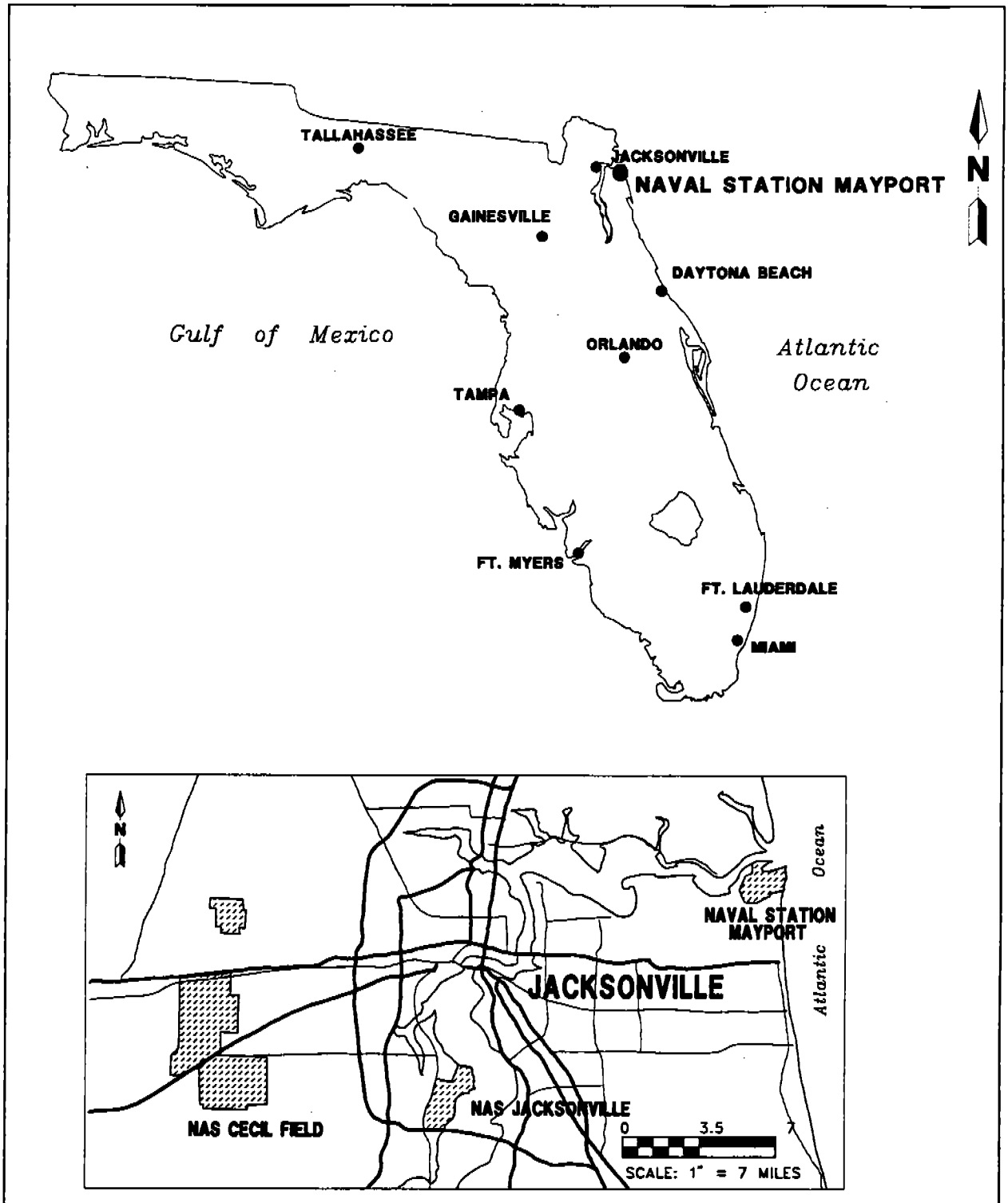


FIGURE 1-1
FACILITY LOCATION MAP

MAYPORT/MAYLOCAT/KCP-WDW/11-14-94-

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

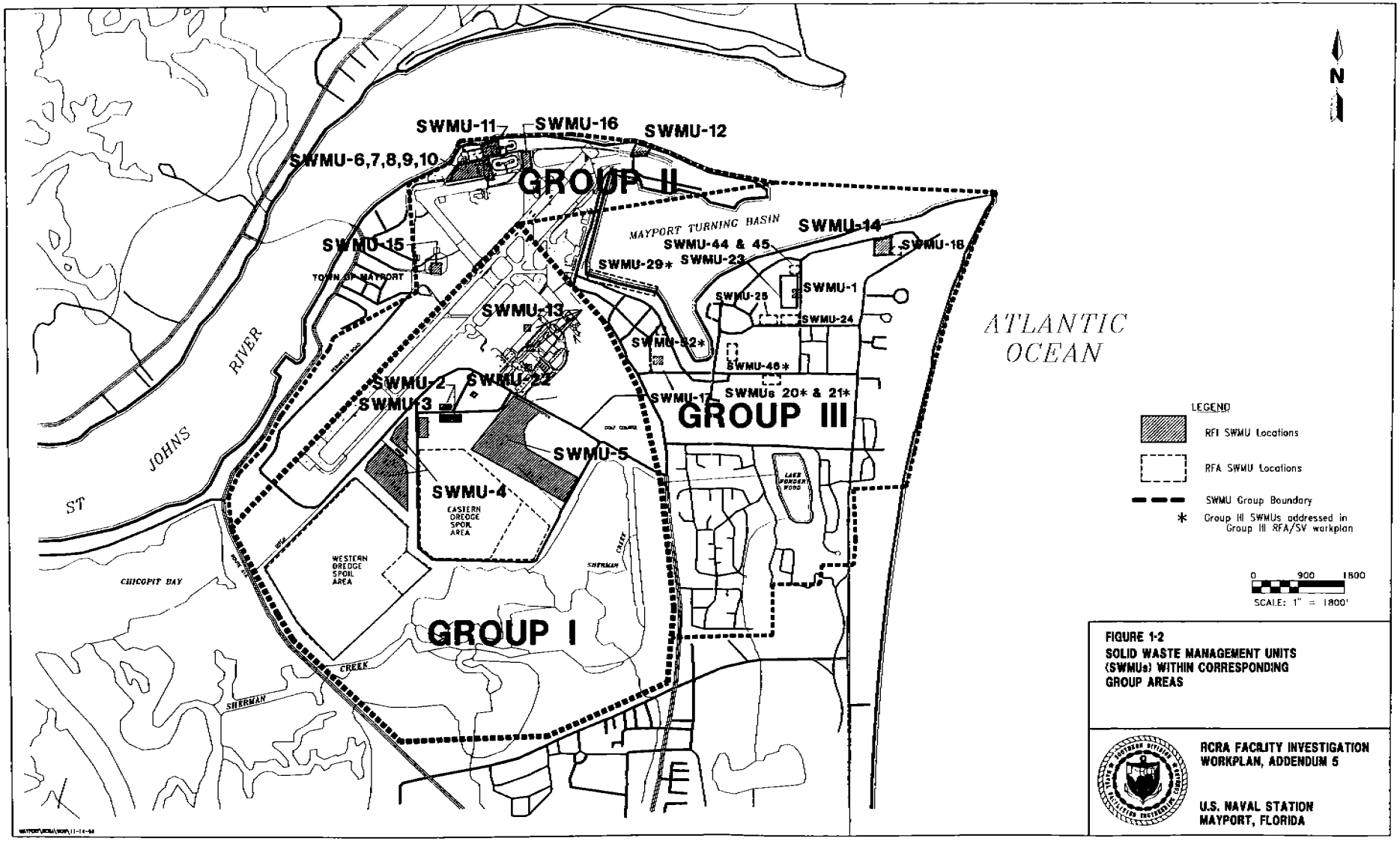


FIGURE 1-2
SOLID WASTE MANAGEMENT UNITS (SWMUs) WITHIN CORRESPONDING GROUP AREAS

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

Spill Area, and shares a similar hydrogeologic setting and similar petroleum-related contamination. SWMUs 23, 24, 25, 44, and 45 are adjacent to SWMU 1, Landfill A, share a similar hydrogeologic setting, and may have some similar contaminants.

The following Group III SWMUs require confirmatory sampling but are being addressed separately in an RCRA Facility Assessment Sampling Visit (RFA/SV) workplan (Figure 1-2).

- SWMU 20, Hobby Shop Drain;
- SWMU 21, Hobby Shop Scrap Storage Area;
- SWMU 29, Oily Waste Pipeline Break;
- SWMU 46, Shore Intermediate Maintenance Activity (SIMA) Engine Drain Sump; and
- SWMU 52, Public Works Department (PWD) Service Station Storage Area.

The purpose of RFA/SV sampling activities is to confirm whether or not contaminant releases have occurred. Based on the results, a determination will be made as to whether no further action is appropriate or an RFI should be conducted.

Addendum 5 to the RFI workplan presents historical information for Group III SWMUs, analytical results of environmental samples collected during previous investigations, and sampling location and rationale required to complete the characterization of contaminants and human health and ecological risk assessments at the SWMUs. This RFI workplan addendum proposes locations to collect environmental samples from suspected affected media (sediment, surface water, soil, groundwater, and sludge) and analytical methods to characterize releases of contaminants to the environment.

1.1 PURPOSE. The purpose of the RFI activities at NAVSTA Mayport is to provide data to:

- confirm the presence or absence of contaminant releases;
- determine the nature and extent of releases from SWMUs;
- characterize the potential pathways of contaminant migration in the soil, sediment, surface water, and groundwater;
- identify potential receptors;
- assess potential risks to human health and the environment; and
- determine whether contaminants released from an SWMU require corrective measures to mitigate the risk to human health or the environment.

1.2 SCOPE. Proposed RFI activities at the Group III SWMUs include the following tasks:

- geophysical survey,

- surface soil sample collection,
- borehole soil sample collection,
- monitoring well installation,
- groundwater sample collection,
- monitoring well and sample location topographic survey,
- *in-situ* slug testing of aquifer properties at monitoring wells,
- monthly groundwater elevation measurements, and
- laboratory analyses of selected 40 Code of Federal Regulations (CFR) Part 264, Appendix IX, Groundwater Monitoring List constituents.

1.3 ENVIRONMENTAL SETTING. NAVSTA Mayport is located within the corporate limits of the city of Jacksonville, Duval County, Florida, approximately 12 miles to the northeast of downtown Jacksonville (Figure 1-1). The station complex is located on the northern end of a peninsula bounded by the Atlantic Ocean to the east and the St. Johns River to the north and west. NAVSTA Mayport occupies the entire northern part of the peninsula except for the town of Mayport to the west, between the base and the St. Johns River (Figure 1-2).

NAVSTA Mayport was commissioned in 1942 on approximately 700 acres of land. The station initially consisted of a harbor and an airfield constructed from the dredging of Ribault Bay. The harbor was dredged to a depth of 29 feet below mean sea level (msl), and is referred to as the Mayport Turning Basin. The turning basin is surrounded on three sides by ship piers.

The original mission of the station included use by patrol craft, target boats, and rescue boats. The station was placed in caretaker status from 1946 to 1948. In 1948 the station reopened, and in 1952 an aircraft carrier was assigned to the station. To allow the aircraft carriers and other large ships to berth at NAVSTA Mayport, the turning basin was dredged to a depth of 40 feet. Additionally, the amount of usable land at NAVSTA Mayport was increased by using dredge spoil to fill areas south and west of the turning basin. Figures 1-3 and 1-4 illustrate land features that were present prior to development of NAVSTA Mayport and current land features.

The following subsections provide a brief summary of the physiography, topography, regional hydrology, geology, and hydrogeology of the NAVSTA Mayport area. For a more detailed discussion of these site features please refer to the Technical Memorandum, Background Characterization Activities, RCRA Facility Investigation, NAVSTA Mayport (ABB-ES, 1994a).

1.3.1 Physiography and Topography NAVSTA Mayport is situated in the southeastern Coastal Plain physiographic province. The topography of the Coastal Plain in northeastern Florida is controlled by a series of ancient marine terraces, which formed during the Pleistocene when sea level was higher than at present (Leve, 1966). Seven marine terraces are located in northeast Florida. Moving from west to east and decreasing in elevation, these terraces are the Coharie,

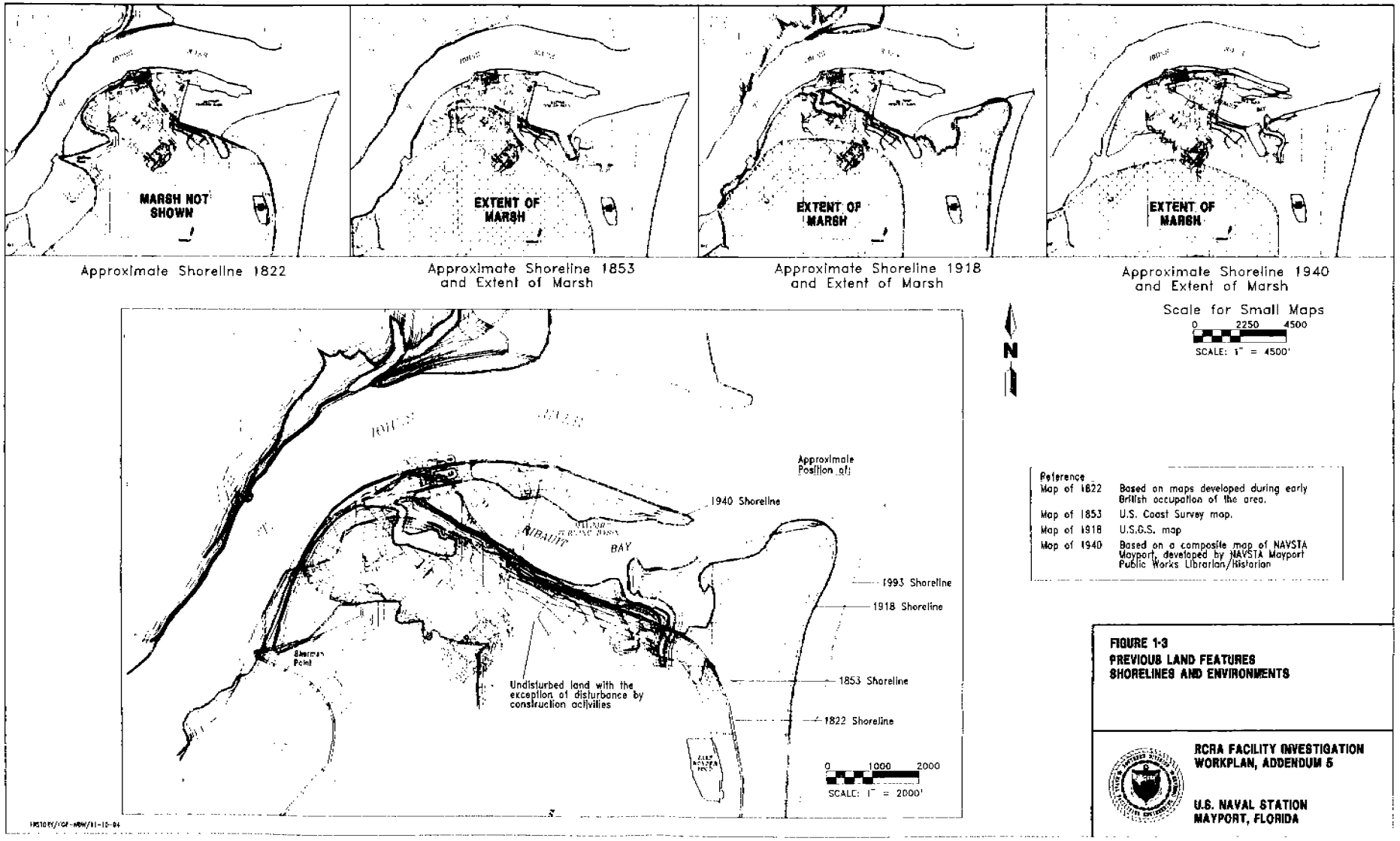


FIGURE 1-3
PREVIOUS LAND FEATURES SHORELINES AND ENVIRONMENTS

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

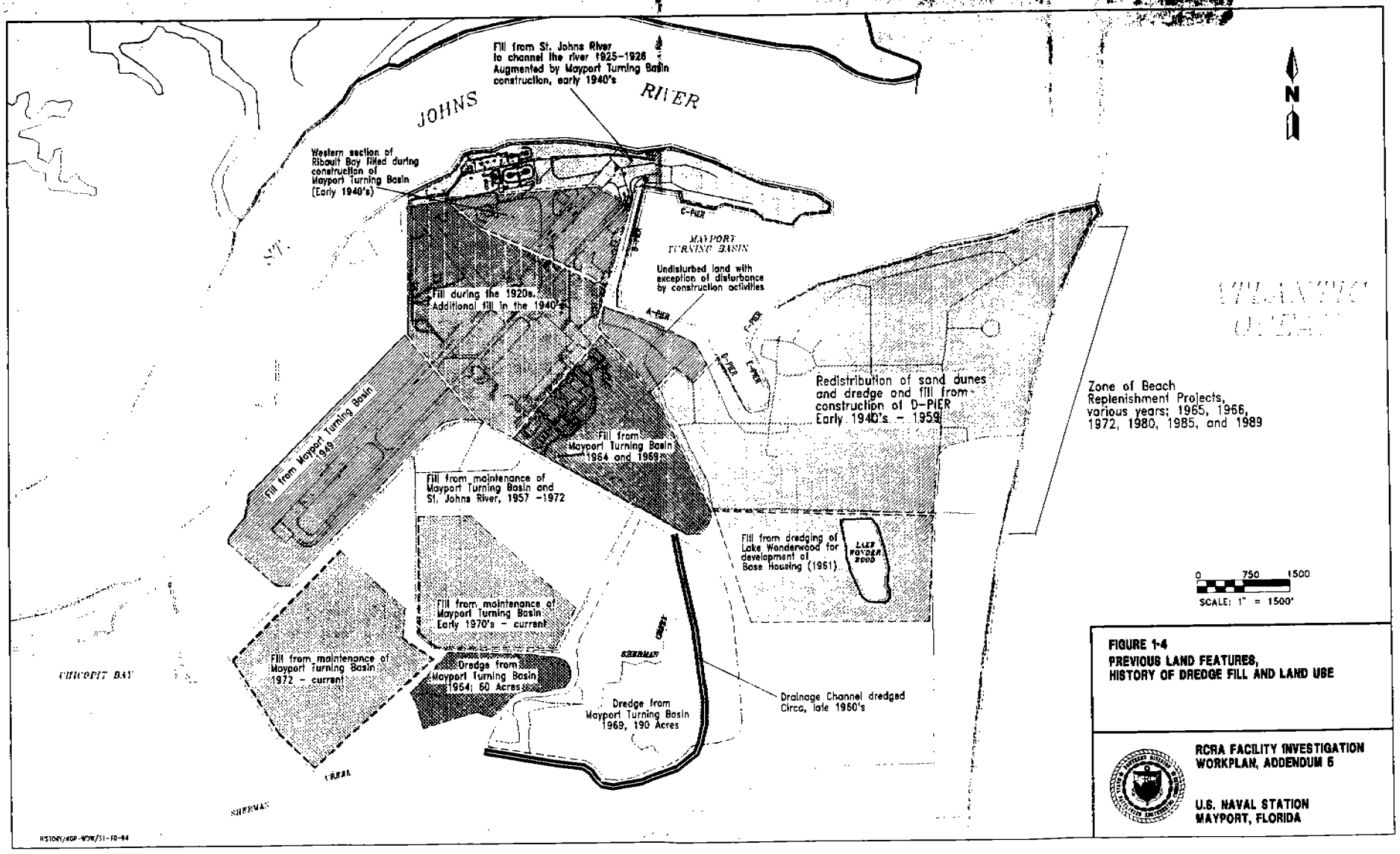


FIGURE 1-4
PREVIOUS LAND FEATURES, HISTORY OF DREDGE FILL AND LAND USE

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 6

U.S. NAVAL STATION MAYPORT, FLORIDA

HISTORY/RIP-WPA/51-F0-94

Sunderland, Wicomico, Penholoway, Talbot, Pamlico, and Silver Bluff terraces. NAVSTA Mayport lies upon remnants of the Pamlico and the Silver Bluff terraces, which form a low coastal plain throughout most of the central and eastern part of northeast Florida. Elevations of these terrace ridge remnants in the vicinity of NAVSTA Mayport range from slightly above mean sea level to 25 feet above msl. The original terrace sediments at NAVSTA Mayport have been modified by sand dune development, stream erosion, and especially by the dredging and filling activities at NAVSTA Mayport.

The land surface exhibits little relief and elevations at NAVSTA Mayport range from about 0 to 30 feet above msl. Most of NAVSTA Mayport has been filled with dredge spoil resulting from the construction and maintenance of the turning basin. The elevations of the runways are higher than most of the surrounding land to provide drainage, and they serve as a topographic drainage divide between the southeast and northwest areas of the station.

1.3.2 Hydrology NAVSTA Mayport is situated at the mouth of the St. Johns River on the south bank (Figure 1-2). Average discharge of the St. Johns River is estimated to be between 6,000 and 8,300 cubic feet per second or about 3,900 to 5,400 million gallons per day (mgd) (Heath and Conover, 1981). The station is bordered on the east by the Atlantic Ocean and to the north and northwest by the St. Johns River. An extensive tract of tidal marsh exists within the boundaries of the station to the south and southwest.

The station has one manmade, freshwater lake, Lake Wonderwood, located in the NAVSTA Mayport housing area. Lake Wonderwood occupies approximately 20 acres and was created to provide fill for construction of the adjacent housing area and for stormwater retention. The lake has a depth of approximately 20 feet and is used by NAVSTA Mayport personnel for recreation.

The other dominant surface water feature on station is the Mayport Turning Basin. The turning basin was constructed during the early 1940's by dredging the eastern part of Ribault Bay (Figures 1-3 and 1-4). Dredge spoil was used to fill part of Ribault Bay and other low lying areas to elevate the land surface. Originally Mayport Turning Basin was dredged to a depth of 29 feet. In 1952 the basin was deepened to a depth of 40 feet to provide access to larger ships. The dredge spoil was used to fill in other topographic low areas of the station (Figure 1-4).

1.3.3 Geology A total of 85 borings have been drilled at NAVSTA Mayport for various investigative activities to define the geology and hydrology of the Miocene to Holocene age deposits and aquifers. Geologic information generated was used to construct geologic cross-section traverses. The locations of five cross-section traverses depicting subsurface geologic conditions are presented on Figure 1-5. A key to the lithologic symbols used in the cross sections is provided in Figure 1-6. These cross sections (Figures 1-7 through 1-11) reveal three separate geologic units. The uppermost unit consists of a surficial deposit of material dredged from the Mayport Turning Basin and the St. Johns River. Beneath the surficial dredge material, a uniform, poorly graded, well sorted, sand (Unified Soil Classification System [USCS] SP) unit with layers of a very soft grey to dark-grey silty clay (USCS CH and CM) is found. This sand unit, termed in the cross sections as undifferentiated post-Hawthorn deposits, grades at depth into the third unit, the Coosawhatchie Formation of the upper Hawthorn Group (Scott, 1988).

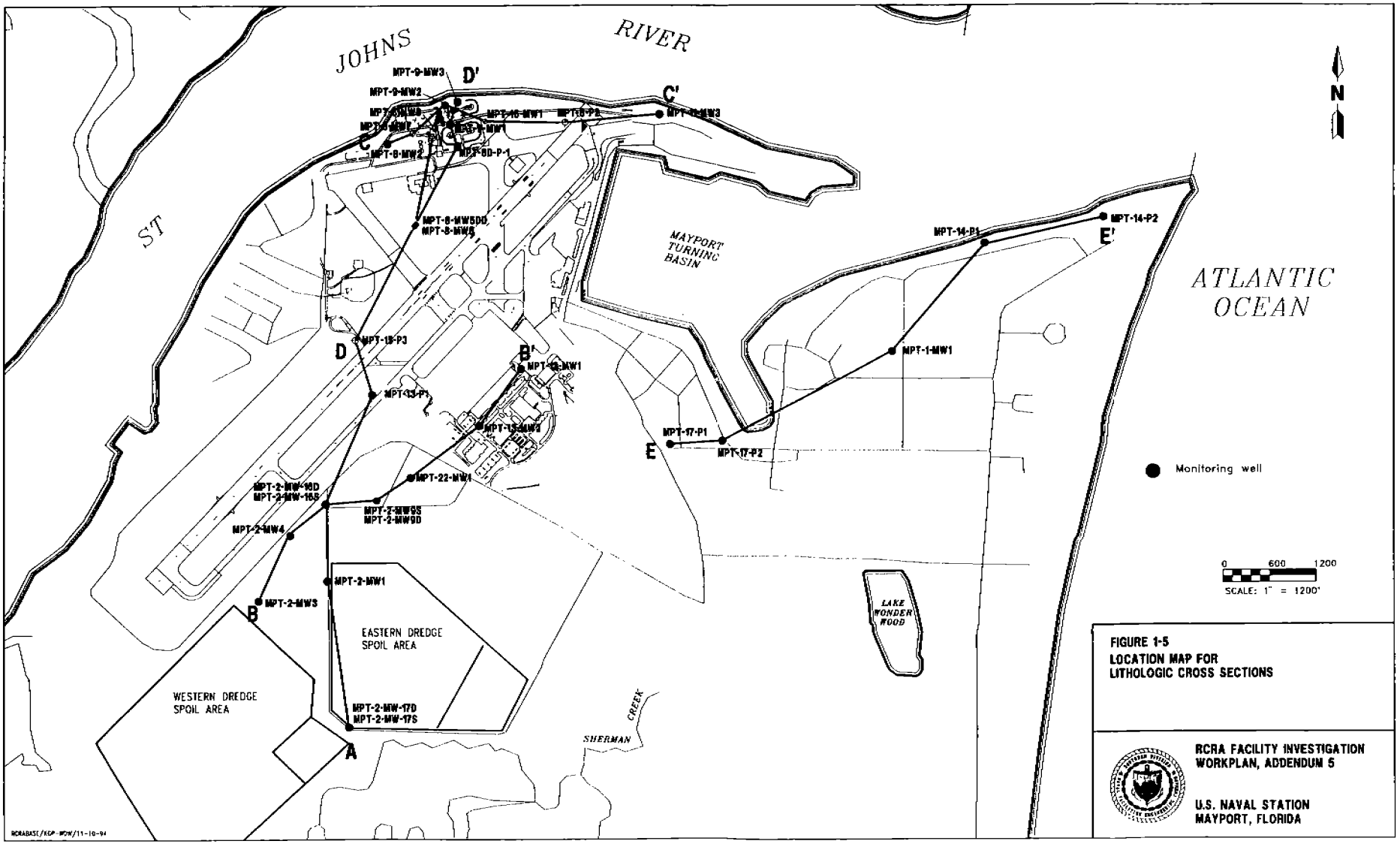
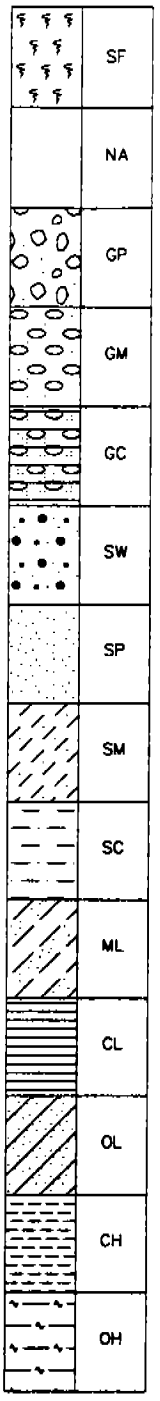


FIGURE 1-5
LOCATION MAP FOR
LITHOLOGIC CROSS SECTIONS

RCRA FACILITY INVESTIGATION
WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION
MAYPORT, FLORIDA



Shell fragment, with fine sand

Crushed limestone, asphalt pavement

Poorly-graded gravels, gravel-sand mixtures, little or no fines, shell hash

Gravel-sand-silt mixtures

Clayey gravels gravel-sand-clay mixtures

Well-graded sands, gravelly sands, little or no fines

Poorly-graded sands, gravelly sands, little or no fines

Silty sands, Sand-silt mixtures

Clayey sands, Sand-clay mixtures

Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity

Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays

Organic silts and organic silty clays of low plasticity

Inorganic clays of high Plasticity, fat clays

Organic clays of medium to high plasticity, organic silts

Source: USCS.

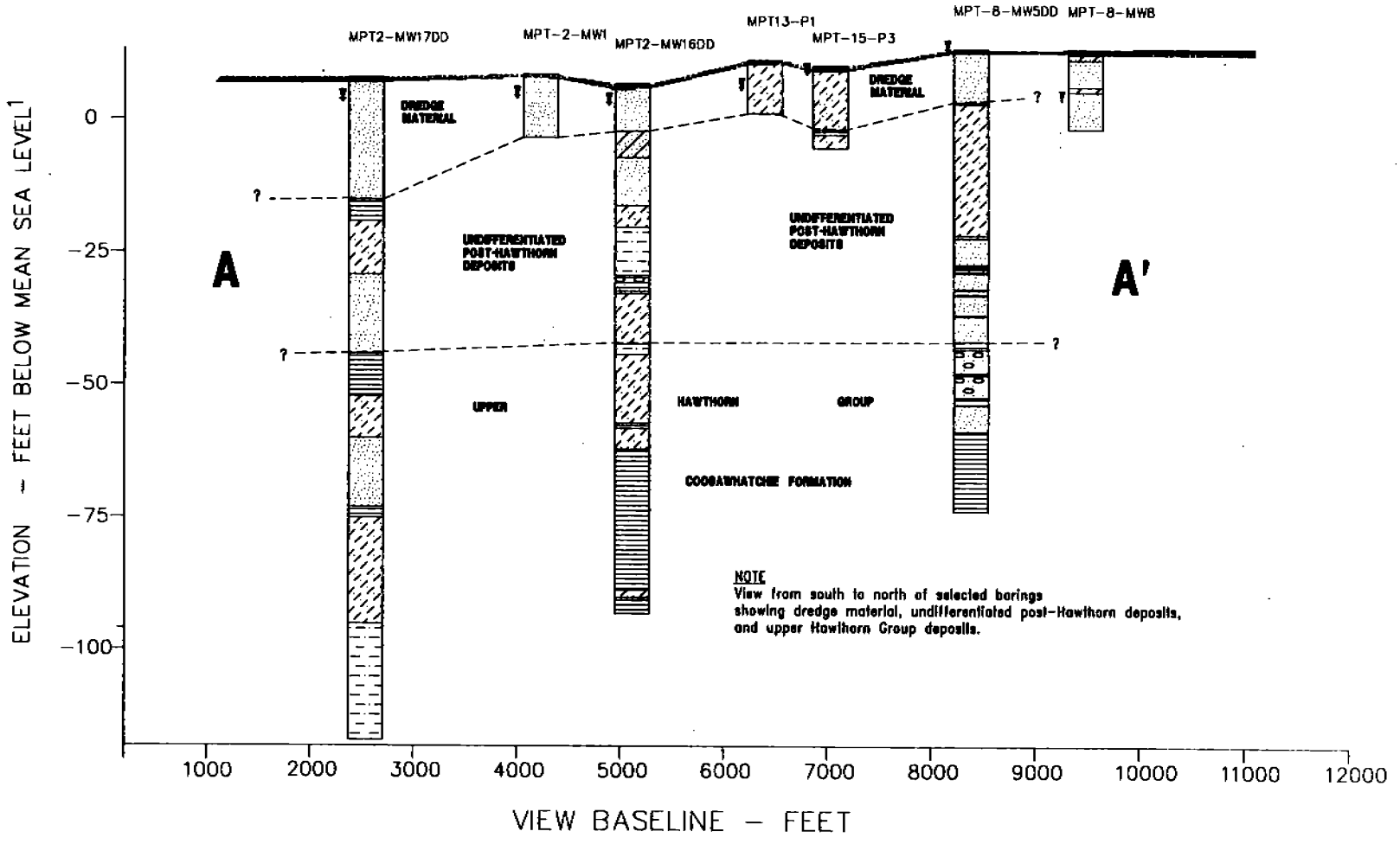
Water table elevation location

FIGURE 1-6
KEY TO LITHOLOGIC SYMBOLS

RCRASECT.DWG\MAH-WDW\11-10-94

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA



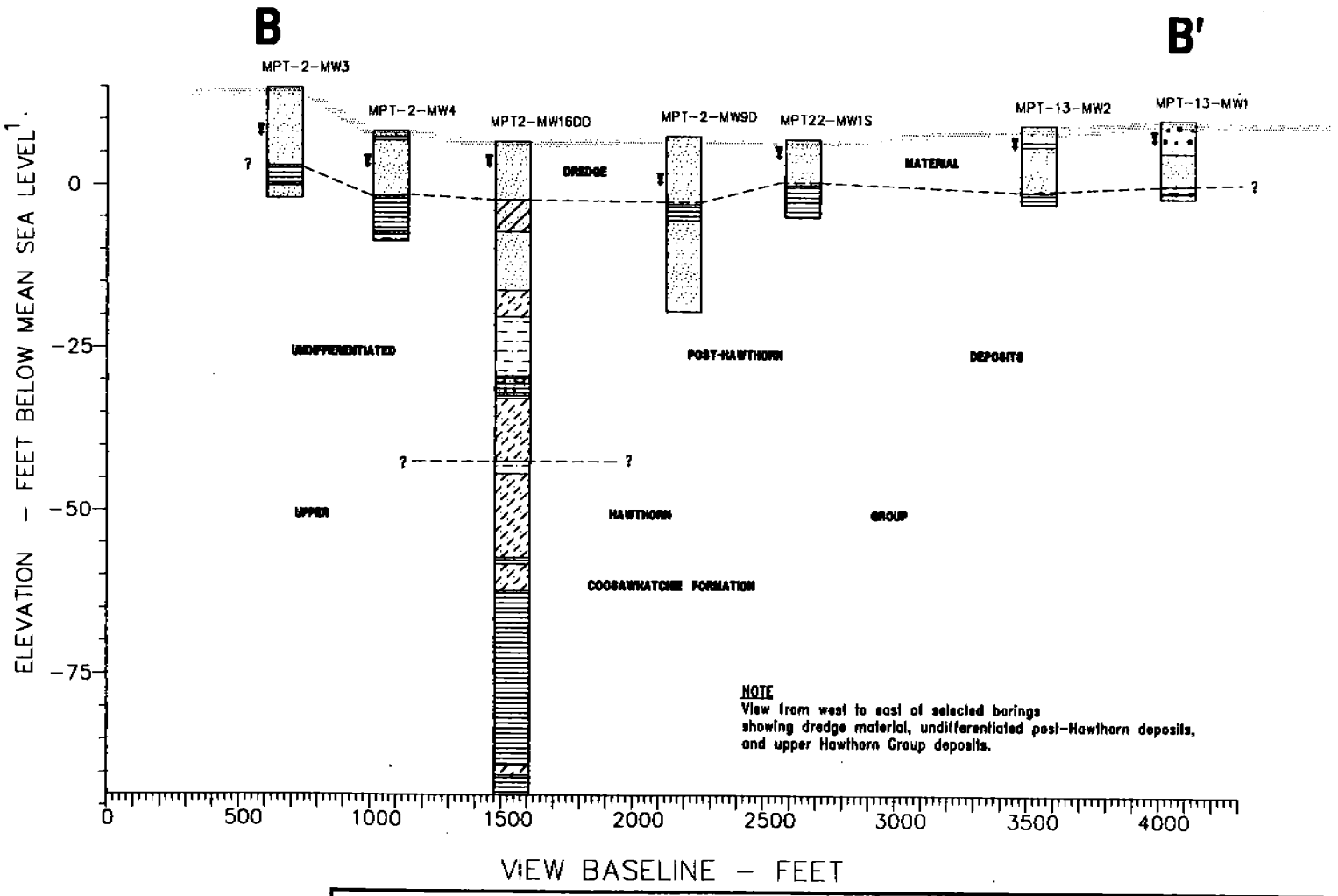
Note:
1 = National Geodetic Vertical Datum, 1929.

FIGURE 1-7
CROSS SECTION A-A', GROUP I AND GROUP II SWMUs

RCRASECT.DWG/KP-WDW/11-11-94

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA



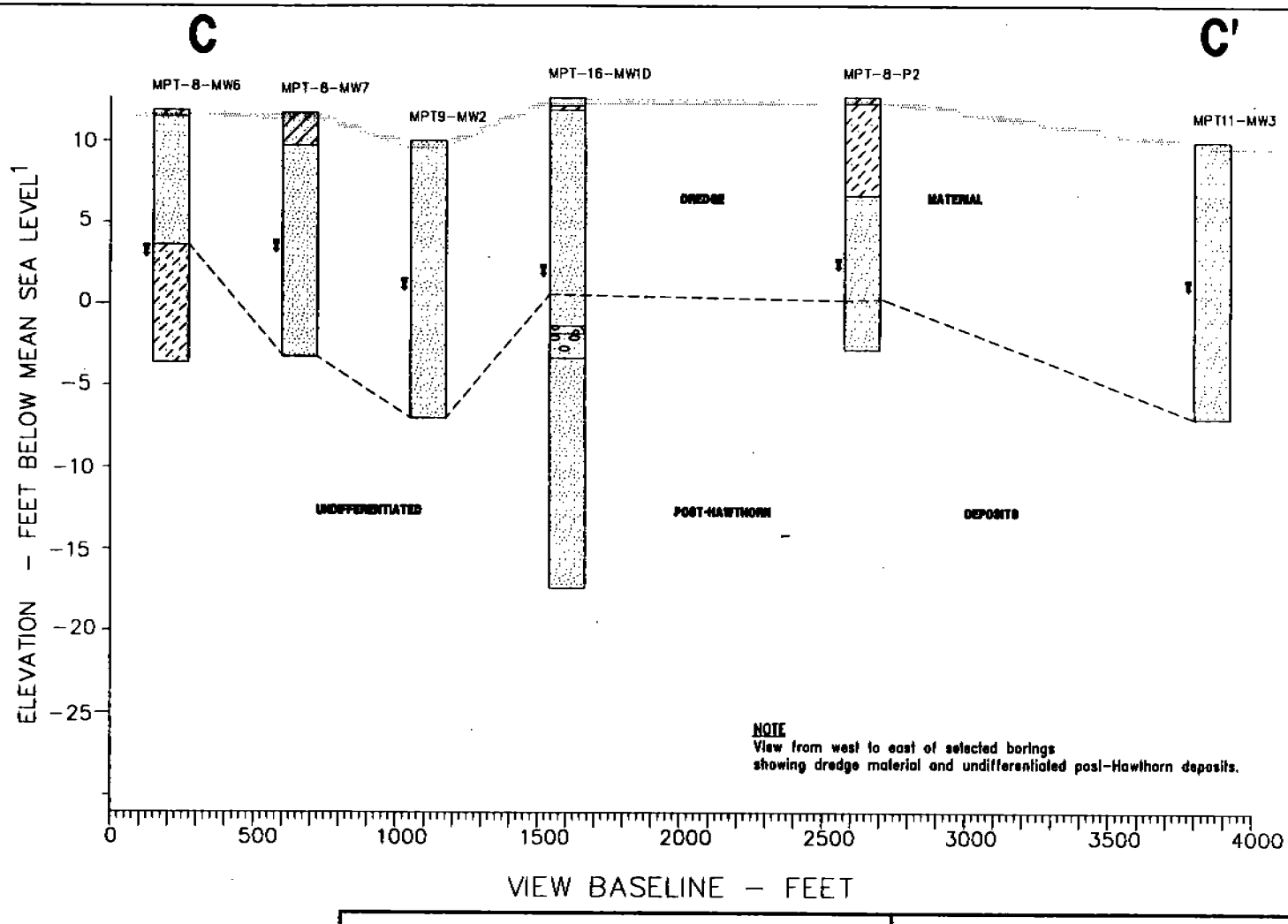
Note:
1 = National Geodetic Vertical Datum, 1929.

FIGURE 1-8
CROSS SECTION B-B',
GROUP I SWMUs

RCRA FACILITY INVESTIGATION
WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION
MAYPORT, FLORIDA

RCRASECT.DWG/KP-WOW/11-11-94



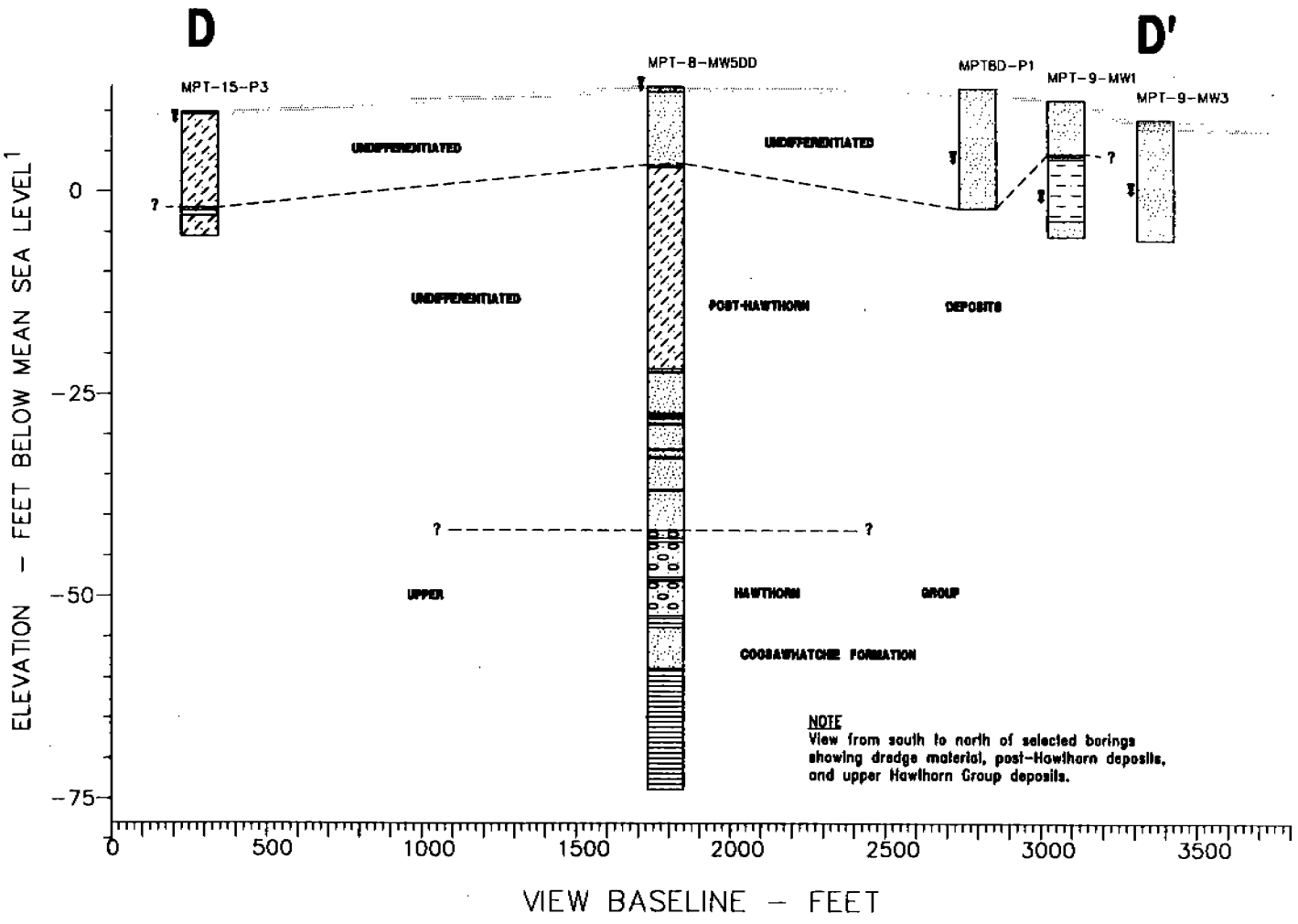
Note:
1 = National Geodetic Vertical Datum, 1929.

FIGURE 1-9
CROSS SECTION C-C',
GROUP II SWMUs

RCRASECT.DWG/KP-WDW/11-11-94

RCRA FACILITY INVESTIGATION
WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION
MAYPORT, FLORIDA



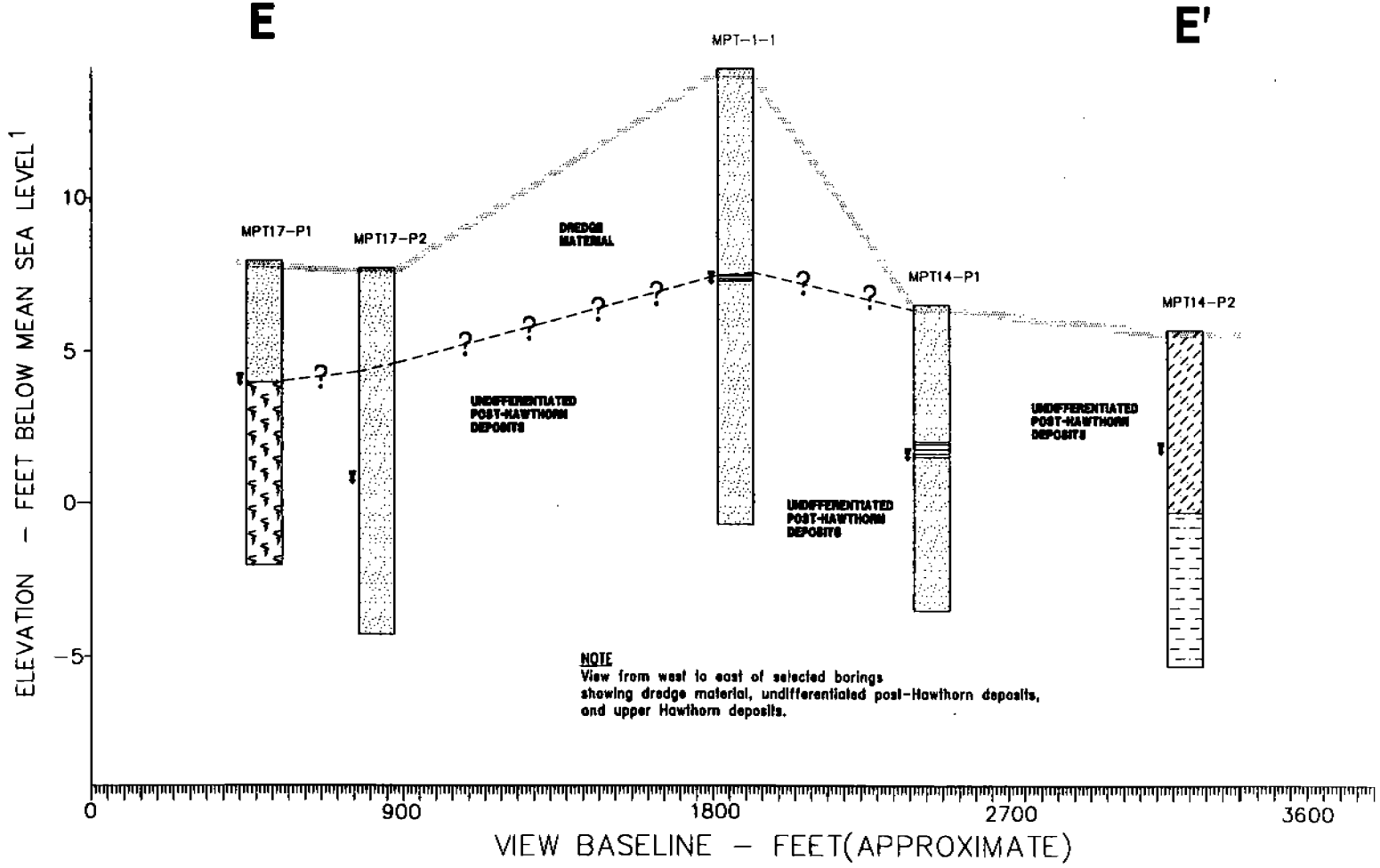
Note:
1 = National Geodetic Vertical Datum, 1929.

FIGURE 1-10
CROSS SECTION D-D',
GROUP II SWMUs

RCRA FACILITY INVESTIGATION
WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION
MAYPORT, FLORIDA

RCRASECT.DWG/KP-WDW/11-11-94



Note:
1 = National Geodetic Vertical Datum, 1929.

FIGURE 1-11
CROSS SECTION E-E',
GROUP III SWMUs

RCRASECT.DWG/KP-WDW/11-11-94

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

1.3.4 **Hydrogeology** The surficial aquifer extends to a depth of approximately 70 feet below land surface (bls) (Causey and Phelps, 1978; Franks, 1980). It is comprised of unconsolidated deposits of sand, shells, and clay, which vary horizontally and vertically in lithology, thickness, and permeability. The surficial aquifer consists of sediments of the upper Hawthorn Group (middle Miocene age), upper Miocene and Pliocene deposits, and Pleistocene and Holocene deposits. Causey and Phelps (1978) report that the surficial aquifer under most of Duval County is composed of an upper and a lower zone that are separated by deposits of lower permeability at a depth from 25 to 50 feet bls. Franks (1980), however, found no evidence of this confining bed in the eastern part of NAVSTA Mayport.

The surficial aquifer is recharged by local precipitation at an estimated rate of 10 to 16 inches per year (Fairchild, 1972). Discharge is by pumpage, outflow from springs, downward percolation, evapotranspiration, and discharge to surface water bodies. Throughout much of NAVSTA Mayport, surficial groundwater flow is generally toward the major surface water features. These water bodies include the Atlantic Ocean to the east, the St. Johns River to the north and west, and Sherman Creek and associated tidal marshes to the south.

Geraghty & Miller (1983), citing the work of Causey and Phelps (1978), report that groundwater in the surficial aquifer at NAVSTA Mayport is fresh in the upper part but becomes brackish below a depth of 40 feet bls. This phenomenon was also confirmed by Frazee and McClaugherty (1979) in other areas near NAVSTA Mayport. Groundwater in the unconfined surficial aquifer is currently classified as Class G-II as defined by Chapter 62-3.403, Florida Administrative Code (FAC). Class G-II groundwater is potable-use groundwater in aquifers that have a total dissolved solids (TDS) content of less than 10,000 milligrams per liter (mg/ℓ), unless otherwise classified. Class G-II groundwater should meet primary and secondary drinking water quality standards as listed in Chapters 62-550.310 and 62-550.320, FAC.

2.0 PREVIOUS INVESTIGATIONS

Previous environmental investigations of sites potentially contaminated by hazardous constituents at NAVSTA Mayport have been conducted under the Navy's Installation Restoration (IR) program and its predecessor, the Naval Assessment and Control of Installation Pollutants (NACIP) program. These investigations consisted of an Initial Assessment Study (IAS) conducted in late 1985 by Environmental Science and Engineering, Inc. (Environmental Science and Engineering, 1986), and an Expanded Site Investigation (ESI) conducted in late 1987 by E.C. Jordan Company (1988). The USEPA, through its subcontractor A. T. Kearney, conducted a Visual Site Inspection (VSI) during the initial stages of the RFA in 1989 (A.T. Kearney, Inc., 1989). Characterization of background concentrations of target analytes in soil, sediment, surface water, and groundwater has also been conducted for NAVSTA Mayport (ABB-ES, 1994b).

2.1 INITIAL ASSESSMENT STUDY (IAS). The purpose of the IAS was to identify and assess sites posing a potential threat to human health or the environment due to contamination from past hazardous waste operations. The IAS included a search of records available at both the station and other Federal and State government agencies followed by an onsite survey and interviews with facility personnel. Each site identified during this process was then evaluated for contaminant characteristics, migration pathways, and potential receptors. Recommendations were made regarding the need for additional investigations. The IAS identified 17 potentially contaminated sites at NAVSTA Mayport and recommended 8 for further study. Group III SWMUs identified for further study included SWMU 1 (Landfill A), SWMU 14 (Mercury/Oily Waste Spill Area), SWMU 17 (Carbonaceous Fuel Boiler), and SWMU 29 (Oily Waste Pipeline Break).

2.2 EXPANDED SITE INVESTIGATION (ESI). The purpose of the ESI was to determine whether specific toxic and hazardous materials are present at suspected waste disposal sites and to recommend further action if required. Ten sites identified in the IAS were investigated during the ESI. Group III SWMUs investigated during the ESI were SWMU 1 (Landfill A) and SWMU 14 (Mercury/Oily Waste Spill Area).

The investigations included performing a terrain conductivity survey, collecting four surface water and sediment samples, installing 28 monitoring wells, and collecting 30 surface and subsurface soil samples and 27 groundwater samples. Based on evaluation of the data, the ESI recommended remedial action at one Group I SWMU site (SWMU 2) based on concentrations of polychlorinated biphenyls (PCBs) detected in soil samples. Additional investigations were recommended for two sites (Group I, SWMU 13, the Old Fire Training Area, and Group II, SWMU 16, the Old Transformer Storage Yard) to further clarify the site conditions and verify the presence of contamination. Risk assessments were recommended at seven sites based on the concentrations of pesticides and metals detected in groundwater or surface water samples. Risk assessments were recommended for Group III, SWMU 1 (Landfill A), because of the concentrations of 4,4'-dichlorodiphenyldichloroethane (DDD) and lead detected in groundwater and for Group III, SWMU 14, because of the concentration of mercury detected in a groundwater sample.

2.3 RCRA FACILITY ASSESSMENT (RFA). An RFA for NAVSTA Mayport was conducted on behalf of the USEPA Region IV by their contractor, A.T. Kearney, Inc., in 1989. During a VSI conducted for the RFA, 56 SWMUs and 2 Areas of Concern (AOC) were identified at NAVSTA Mayport. Fifteen of these SWMUs were determined to require no further action under the RCRA Corrective Action Program. Eighteen SWMUs were determined to require an RFI. Twenty-three of the SWMUs were determined to require confirmatory sampling through an RFA. The 41 SWMUs requiring further action were divided into three geographical groups (I, II and III). Group III SWMUs requiring an RFI consist of the following (Figure 1-2):

- SWMU 1, Landfill A;
- SWMU 14, Mercury/Oily Waste Spill Area; and
- SWMU 17, Carbonaceous Fuel Boiler.

Group III SWMUs requiring confirmatory sampling consist of the following (Figure 1-2):

- SWMU 18, FTC Diesel Generator Sump;
- SWMU 20, Hobby Shop Drain;
- SWMU 21, Hobby Shop Scrap Storage Area;
- SWMU 23, JSI Area;
- SWMU 24, NFSI Area;
- SWMU 25, AMI Area;
- SWMU 29, Oily Waste Pipeline Break;
- SWMU 44, Wastewater Clarifiers 1 and 2;
- SWMU 45, Wastewater Treatment Facility Sludge Drying Beds;
- SWMU 46, SIMA Engine Drain Sump; and
- SWMU 52, PWD Service Station Storage Area.

2.4 BACKGROUND CHARACTERIZATION. A facility-wide background investigation of surface soil, groundwater, surface water, and sediment has been conducted in conjunction with the RFI at Group I and II SWMUs. The results of the background characterization are provided in the *Technical Memorandum Background Characterization Activities RCRA Facility Investigation, NAVSTA Mayport, Florida* (ABB-ES, 1994a). The background study was performed to establish background screening values for each target analyte. The established background screening value is 2 times the arithmetic mean of detected analytes. Target analytes detected in each medium will be screened against promulgated regulatory criteria and unpromulgated guidelines or advisories and the background screening value to identify contaminants of potential concern (CPCs) that require a Health and Environmental Assessment (HEA). Tables 2-1 through 2-4 present the maximum detected value, frequency of detection, and screening values for target analytes detected in soil, sediment, surface water, and groundwater, respectively.

Data gaps for the background samples were identified in the Technical Memorandum, Background Characterization Activities report and include subsurface soil samples, background surface water and sediment samples from the St. Johns River and Mayport Turning Basin, additional groundwater samples from the existing shallow background monitoring wells, and the need for a background groundwater sample from a deep groundwater monitoring well (ABB-ES, 1994a). Samples to fill the data gaps were collected during the investigation of Group I and II SWMUs (ABB-ES, 1993a).

Table 2-1
Summary of Background Soil Screening Values

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

CAS RN	Common Name	Unit	Maximum Detected Concentration	Qual.	Frequency[1] of Detection	Arithmetic Mean or Single Value	Background Screening Value	CSC
75-55-9	4,4'-DDE	µg/kg	2.3		1/7	2.3	4.6	NA
7440-39-3	Barium	mg/kg	5.0	B	7/7	2.7	5.4	275
7440-41-7	Beryllium	mg/kg	0.09	B	2/7	0.075	0.15	NA
7440-39-4	Cadmium	mg/kg	1.0	B	1/7	1.0	2.0	5
7440-72-2	Chromium	mg/kg	2.5		7/7	1.29	2.58	27
7440-50-8	Copper	mg/kg	2.1	B	1/7	2.1	4.2	NA
7440-49-2	Selenium	mg/kg	0.86	B	7/7	0.63	1.26	16
7440-28-0	Thallium	mg/kg	1.1	J	4/7	0.89	1.78	NA
7440-62-2	Vanadium	mg/kg	2.5	B	7/7	1.88	3.76	NA
7440-66-6	Zinc	mg/kg	1.9	J	7/7	1.29	2.58	NA

[1] The first number denotes the number of detections. The second number denotes the number of samples.

Notes: CAS RN = chemical abstract service registry number.
Qual. = qualifier. Data validation codes J and B in the Qual. column were verified and assigned by Heartland Environmental Services.
CSC = clean soil criteria; total concentration of inorganic analyte permitted in "clean" petroleum contaminated soil, Chapter 62-775.410, Florida Administrative Code (FAC).
DDE = dichlorodiphenyldichloroethene.
µg/kg = microgram per kilogram.
NA = no criteria established.
mg/kg = milligrams per kilogram.
B = concentration is estimated to be less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL).
J = estimated concentration.

Table 2-2
Summary of Sediment Screening Values

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

CAS RN	Common Name	Units	Maximum Detected Concentration	Qual.	Frequency[1] of Detection	Arithmetic Mean or Single Value	Background Screening Value	SQGs		NOAA	
								NOEL	PEL	ER-L	ER-M
75-15-0	Carbon disulfide	µg/kg	83.0		2/9	51	102	--	--	--	--
108-88-3	Toluene	µg/kg	3.0	J	1/9	3.0	6.0	--	--	--	--
117-87-7	Bis(2-ethylhexyl)phthalate	µg/kg	200.0	J	29	170	340	--	--	--	--
87-74-2	Di-n-butylphthalate	µg/kg	71.0	J	39	65	130	--	--	--	--
129-00-0	Pyrene	µg/kg	99.0	J	1/9	99	198	290	1,900	350	2,200
75-55-9	4,4'-DDE	µg/kg	7.9		1/9	5.42	10.9	1.7	130	1.0	7.0
75-54-8	4,4'-DDD	µg/kg	4.2		2/9	2.5	5.0	--	--	1.0	7.0
7440-38-2	Arsenic	mg/kg	6.6		4/9	3.19	6.38	8	64	33	85
7440-39-3	Barium	mg/kg	16.1	J	9/9	7.32	14.64	--	--	--	--
7440-41-7	Beryllium	mg/kg	0.1		1/9	0.1	0.2	--	--	--	--
7440-39-4	Cadmium	mg/kg	0.82	J	1/9	0.82	1.64	1	7.5	5	9
7440-72-2	Chromium	mg/kg	28.1		9/9	8.24	16.48	33	240	80	145
7440-50-8	Copper	mg/kg	5.0	J	8/9	2.53	5.06	28	170	70	390
7440-92-1	Lead	mg/kg	10.0		7/9	4.57	9.14	21	160	35	110
7439-97-6	Mercury	mg/kg	0.24	J	2/9	0.23	0.46	0.1	1.4	0.15	1.3
7440-02-0	Nickel	mg/kg	7.1	J	3/9	6.33	12.66	--	--	30	50
7440-49-2	Selenium	mg/kg	0.81		7/9	0.57	1.14	--	--	--	--
7440-28-0	Thallium	mg/kg	0.88	J	1/9	0.88	1.76	--	--	--	--
7440-31-5	Tin	mg/kg	12.3	B	2/9	53.55	107.1	--	--	--	--
7440-62-2	Vanadium	mg/kg	28.4		9/9	8.01	16.02	--	--	--	--
7440-66-6	Zinc	mg/kg	32.1		9/9	11.85	23.7	68	300	120	270

[1] The first number denotes the number of detections. The second number denotes the number of samples.

Notes: CAS RN = chemical abstract service registry number.
Qual. = qualifier. Data validation codes J and B in the Qual. column were verified and assigned by Heartland Environmental Services.
SQGs = sediment quality guidelines developed for the Florida Coastal Management Program by MacDonald Environmental Science, 1992.
NOEL = no observed effect level.
PEL = probable effects level.
NOAA = National Oceanic and Atmospheric Administration; concentration of potentially toxic substances in marine and estuarine sediment (1990).
ER-L = effects range low (concentration below which adverse effects are not likely).
ER-M = effects range medium (concentrations above which adverse effects are probable).
µg/kg = micrograms per kilogram.
-- = NOEL or PEL not established or no ER-L or ER-M data.
J = estimated concentration.
mg/kg = milligrams per kilogram.
B = concentration is estimated to be less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL).

Table 2-3
Summary of Background Surface Water Screening Values

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

CAS RN	Common Name	Maximum Detected Concentration	Qual.	Frequency[1] of Detection	Arithmetic Mean or Single Value	Background Screening Value	FSWCS	FDWS FDWR	AWQC Marine Environment			
									Fish and Water	Fish Only	Acute	Chronic
96-12-8	1,2-Dibromo-3-chloro-propane	10.0	J	3/5	10.0	20.0	22	–	–	–	–	–
56-96-3	2-Acetamidofluorene	10.0		1/5	10.0	20.0	–	–	–	–	–	–
117-81-7	bis(2-Ethylhexyl)-phthalate	3.0	J	1/9	3.0	4.0	–	4.0	15,000	50,000	400	360
7440-38-2	Arsenic	8.1	B	6/9	2.76	5.52	50	50	0.0022	0.0175	–	–
7440-39-3	Barium	15.4	J	9/9	11.39	22.78	1,000	1,000	1,000	–	–	–
7440-43-9	Cadmium	2.4		1/9	2.4	4.8	5	10	10	–	43	9.3
7440-72-2	Calcium	168,000		5/5	127,140	254,280	–	–	–	–	–	–
7440-72-2	Chromium	4.0	J	1/9	4.0	8.0	H_1	100	–	–	–	–
7440-50-8	Copper	37.2		3/9	14.0	28.0	H_2	1,000	–	–	2.9	–
7439-89-6	Iron	435.0		4/5	192	300	300	300	–	–	–	–
7440-92-1	Lead	1.5	J	2/9	1.24	2.48	5.6	50	50	–	220	8.8
7439-95-4	Magnesium	490,000		5/5	279,320	558,640	–	–	–	–	–	–
7439-96-5	Manganese	98.7		5/5	52.66	50	–	50	–	–	–	–
7440-02-0	Nickel	19.8	B	2/9	16.4	8.3	8.3	100	50	100	75	8.3
7440-49-2	Selenium	2.6	J	2/9	2.2	4.4	71	10	10	–	300	71
7440-23-5	Sodium	386,000		2/5	383,000	766,000	–	160,000	–	–	–	–
7440-28-0	Thallium	73.7	B	1/9	73.7	48	48	2	–	–	–	–
7440-31-5	Tin	776.0		1/9	776	1,552	–	–	–	–	–	–
7440-62-2	Vanadium	5.0	B	5/9	4.36	8.72	–	–	–	–	–	–
7440-66-6	Zinc	6.1	B	3/9	5.9	11.8	86	5,000	–	–	95	86
5955-70-0	Cyanide	3.0	J	1/9	3.0	1.0	1.0	200	200	–	1.0	–

[1] The first number denotes the number of detections. The second number denotes the number of samples.

Notes: All concentrations are reported in micrograms per liter.
CAS RN = chemical abstract service registry number.
Qual. = qualifier. Data validation codes J and B in the Qual. column were verified and assigned by Heartland Environmental Services.
FSWCS = Florida Surface Water Classification Standards, Chapter 62-302, Florida Administrative Code (FAC).
FDWS = Florida Drinking Water Standards, Chapter 62-550, FAC.
FDWR = Federal Drinking Water Regulations, Safe Drinking Water Act, 40 Code of Federal Regulations (CFR) Part 141.
AWQC = Ambient Water Quality Criteria, Clean Water Act, 40 CFR Part 131.
J = estimated concentration.
– = no water quality criteria established.
B = concentration is estimated to be less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL).
H_1 = hardness derived value of 89 micrograms per liter ($\mu g/\ell$) at 1,370 milligrams per liter (mg/ℓ) of calcium carbonate ($CaCO_3$).
H_2 = hardness derived values of 18.8, 100.8, and 204 $\mu g/\ell$ at 404, 1,510, and 2,630 mg/ℓ of $CaCO_3$.

Table 2-4
Summary of Background Groundwater Screening Values

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

CAS RN	Common Name	Maximum Detected Concentration	Qual.	Frequency[1] of Detection	Arithmetic Mean or Single Value	Background Screening Value	FDWS	FDWR
75-15-0	Carbon disulfide	1.0	J	1/4	1	2	--	--
117-81-7	bis(2-Ethylhexyl)phthalate	7.0	J	2/4	6.5	4	4	6
56-55-3	Benzo(a)anthracene	2.0	J	1/4	2	0.1	0.1	0.1
7440-38-2	Arsenic	14.3	J	2/4	8.6	17.2	50	50
7440-39-3	Barium	6.5	B	3/4	2.66	5.32	2,000	2,000
7440-72-2	Calcium	90,000.0	J	2/4	89,750	179,500	--	--
7440-72-2	Chromium	6.6	B	2/4	5.15	10.3	100	100
7440-50-8	Copper	1.4	J	1/4	1.4	2.8	1,000	1,000
7439-89-6	Iron	2,760.0	J	2/4	1,522	300	300	300
7440-92-1	Lead	2.5	J	2/4	1.95	3.9	15	15
7439-95-4	Magnesium	15,400.0		2/4	15,200	30,400	--	--
7439-96-5	Manganese	39.9		2/4	37.95	50	50	50
7440-49-2	Selenium	0.63	J	1/4	0.63	1.26	50	50
7440-62-2	Vanadium	9.4	J	3/4	6.27	12.5	--	--
7440-66-6	Zinc	63.4	J	3/4	32.5	65.0	5,000	5,000

[1] The first number denotes the number of detections. The second number denotes the number of samples.

Notes: All concentrations are in micrograms per liter.
CAS RN = chemical abstract service registry number.
Qual. = qualifier. Data validation codes J and B in the Qual. column were verified and assigned by Heartland Environmental Services.
FDWS = Florida Drinking Water Standards, Chapter 62-550, Florida Administrative Code.
FDWR = Federal Drinking Water Regulations, Safe Drinking Water Act, 40 Code of Federal Regulations Part 141.
J = estimated concentration.
-- = no FDWS or FDWR standards or advisories have been established.
B = concentration is estimated to be less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL).

3.0 PROPOSED GROUP III SOLID WASTE MANAGEMENT UNIT (SWMU) INVESTIGATIVE ACTIVITIES

The Group III RFI SWMUs are being assessed and grouped together with some of the Group III RFA SWMUs (SWMUs requiring confirmatory sampling) for the following reasons. RFA SWMUs 23, 24, 25, 44, and 45 are located adjacent to RFI SWMU 1, Landfill A (Figure 1-2), share similar topographic and hydrogeologic settings, and have similar contaminants. RFA SWMU 18, the FTC Diesel Generator Sump, is located adjacent to RFI SWMU 14, Mercury/Oil Waste Spill Area (Figure 1-2). These two SWMUs share similar topographic and hydrogeologic settings and have similar petroleum-related contamination. RFI SWMU 17, the Carbonaceous Fuel Boiler, is being assessed as a single unit.

3.1 SWMUs 1, 23, 24, 25, 44, AND 45. SWMU 1, Landfill A, includes an area of approximately 4 acres located approximately 600 feet to the south of the entrance to Mayport Turning Basin (Figure 1-2). JSI (SWMU 23) and the two SWMUs at the domestic Wastewater Treatment Plant (WWTP) (SWMUs 44, Wastewater Treatment Facility Clarifiers 1 and 2, and SWMU 45, Wastewater Treatment Facility Sludge Drying Beds) potentially occupy part of what used to be Landfill A. SWMU 24 (NFSI) and SWMU 25 (AMI) have been added to this investigation because of their proximity to SWMU 1 and the similarity of ship repair activities among SWMUs 23 (JSI), SWMU 24 (NFSI), and SWMU 25 (AMI). The RFI field effort for SWMU 1 and the adjacent SWMUs will be conducted as a single comprehensive effort.

3.1.1 Site Descriptions The following sections provide brief site descriptions for SWMUs 1, 23, 24, 25, 44, and 45.

SWMU 1, Landfill A. The RFA report described Landfill A as consisting of a series of trenches approximately 15 feet wide, 400 feet long, and 8 feet deep. Industrial and sanitary wastes disposed in the landfill included waste oils, paints, solvents, sanitary garbage, and construction rubble (A.T. Kearney, Inc., 1989). The landfill's operating routine was reported in the RFA report to consist of filling a part of a trench, then each Monday through Friday afternoon the flammable materials were burned. Once the trenches were filled to the approximate 400 foot length, they were covered with soil (A.T. Kearney, Inc., 1989). The Navy operated the landfill from 1942 to 1960 (A.T. Kearney, Inc., 1989).

Anecdotal evidence from the NAVSTA Mayport Public Works Department obtained during research for RFI Workplan Addendum 5 suggests that in 1989 landfill material was uncovered in the area of the new clarifiers being constructed at the WWTP. Uncovered in the excavation for the clarifiers were scrap metal, sheeting, piping, and 27 drums containing xylene. This suggests that SWMU 1, Landfill A, extends farther to the north and west than originally proposed in the RFA report by A.T. Kearney. Written information documenting the excavation and disposition of the drums of xylene and scrap metal has not been found.

A review of historical aerial photographs also was performed as part of preparing this RFI workplan Addendum 5. Two aerial photographs taken in 1945 and 1948 do not suggest that earth-moving activities were occurring in the area of Landfill A. During the period after the initial construction of NAVSTA Mayport in 1942, and when the station was placed on caretaker status from 1948 to 1949, another

landfill may have been operated on-station or a local landfill off-station may have been used. Interpretation of an aerial photograph dated 1951 suggests the presence of two trenches located in an area directly in front of the JSI Administration Building in what is now the middle of BonHomme Richard Avenue (Figure 3-1). Except for the two trenches observed in the 1951 photograph, no other sources of information were found that would suggest Landfill A was located beneath the JSI Administration Building as described in the RFA report (A.T. Kearney, Inc., 1989).

Reviews of aerial photographs taken between 1954 and 1961 suggest the presence of three areas of disturbed soil where earthmoving activities were occurring (excluding dredging and filling operations) during this period. The location of the three areas of disturbed soil in relation to the location of Landfill A and the area identified in the RFA report are depicted in Figure 3-1. The first disturbed soil area was located to the north and west of the WWTP Sludge Drying Beds (SWMU 45). The second area of disturbed soil was located to the west of the JSI Administration Building, within the JSI area (SWMU 23). The third disturbed soil area was located adjacent to AMI (SWMU 25).

SWMU 23, JSI. SWMU 23 JSI was located approximately 400 feet east of the Mayport Turning Basin (Figure 3-1). JSI occupied approximately 4 acres of land, and is bounded on the north by the WWTP (the location of SWMUs 44 and 45), on the east by BonHomme Richard Avenue, on the west by a dirt road and parking lot, and on the south by NFSI and AMI. JSI was a commercial shipyard company that formerly worked under contract to the Supervisor of Shipbuilding (SUPSHIPs). The JSI property is owned by NAVSTA Mayport and was leased to the company for use in conducting maintenance and repair work on Navy ships. JSI was at this location from approximately 1961 until 1992. JSI has gone out of business and currently is closed. Figure 3-2 is a map showing the JSI area and the locations of existing and former buildings.

Operations conducted at JSI included abrasive media blasting, fabrication of metal parts, metal working, degreasing, paint stripping, welding, automobile maintenance and repair, and other ship support operations. Because of the variety of JSI operations, there are several areas where contaminants could potentially have been released, including oils used in milling of parts, heavy metals in paints, solvents used in cleaning of parts, and fuel storage.

Painting operations were conducted in the southern part of the facility, mainly around areas 20, 21, 22, 23, and 57 (Figure 3-2). The RFA report indicated that during the VSI in 1989 there were numerous empty and partially empty paint and solvent cans stored in a small storage building. The location of this storage area was not identified in the RFA report. However, the storage building may be either Building 27, 57, or 63. Buildings 27 and 63 have been removed. Building 57 remains on the site.

The RFA report indicated that in 1989 approximately 100, 55-gallon drums were stored in the southwestern part of the JSI site. Some of the drums were stacked on pallets and some were stacked directly on the soil. Stained soil and stressed vegetation were noted near some of the stored drums. JSI personnel indicated to A.T. Kearney personnel during the VSI that the drums contained lubrication oil, transmission oils, synthetic oils, and engine oil. The RFA report did not identify the exact location where the drums were stored. However, these drums may have been stored outside of Building 57 (Figure 3-2). A large circular tank

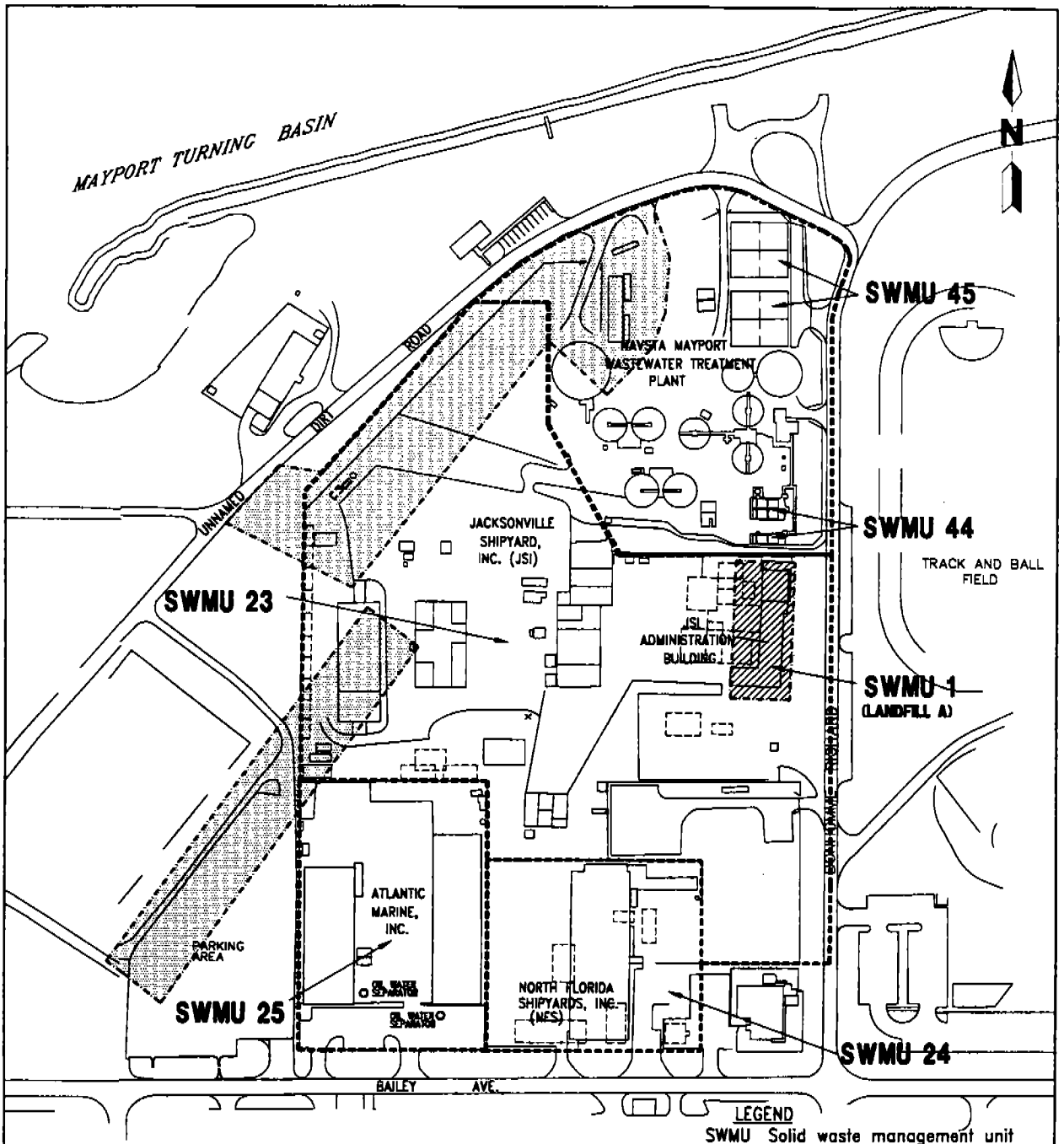


FIGURE 3-1
POTENTIAL LOCATIONS OF LANDFILL A

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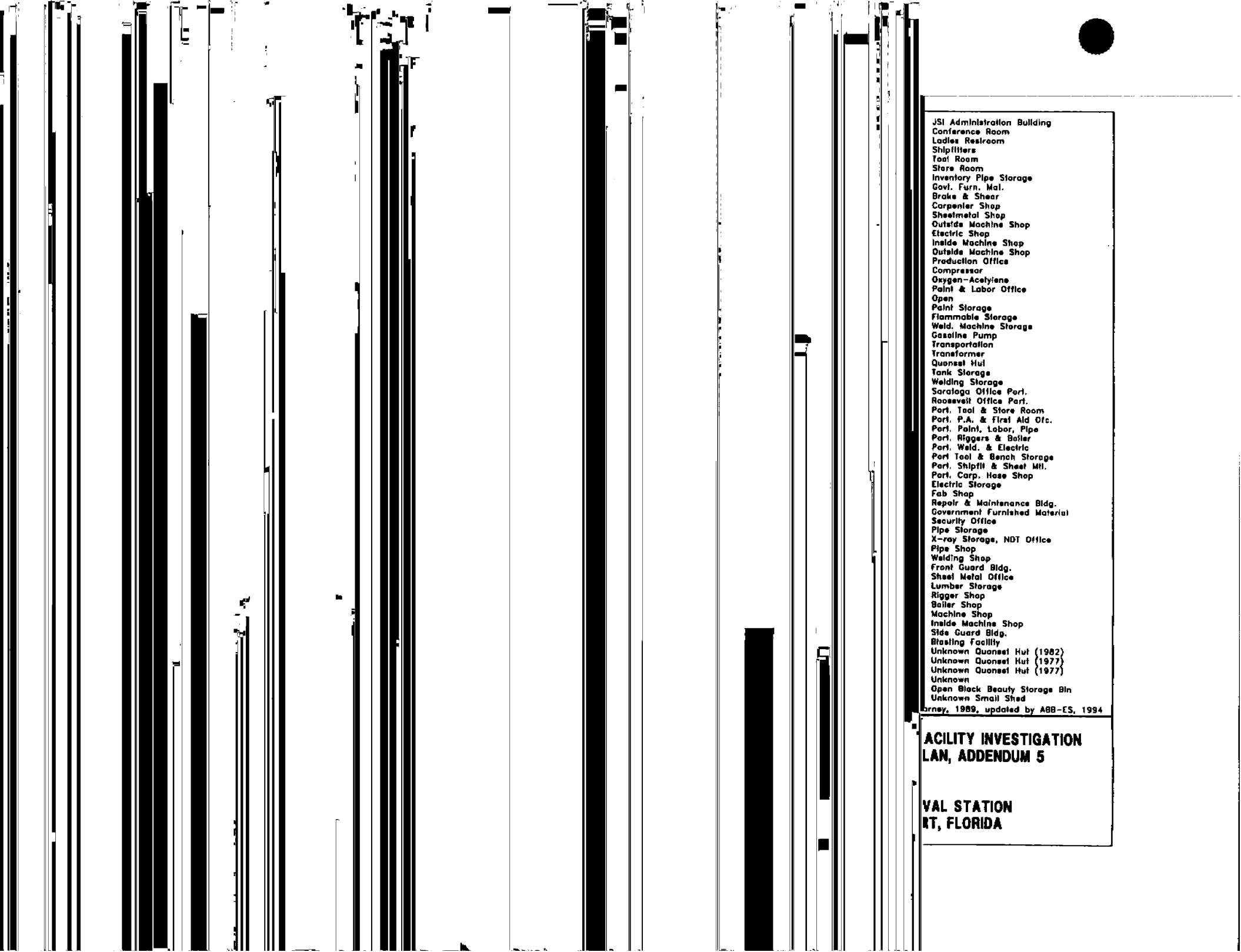

JSI Administration Building
Conference Room
Ladies Restroom
Shipfitters
Tool Room
Store Room
Inventory Pipe Storage
Govt. Furn. Mat.
Brake & Shear
Carpenter Shop
Sheetmetal Shop
Outside Machine Shop
Electric Shop
Inside Machine Shop
Outside Machine Shop
Production Office
Compressor
Oxygen-Acetylene
Paint & Labor Office
Open
Paint Storage
Flammable Storage
Weld. Machine Storage
Gasoline Pump
Transportation
Transformer
Quonset Hut
Tank Storage
Welding Storage
Saratoga Office Port.
Roosevelt Office Port.
Port. Tool & Store Room
Port. P.A. & First Aid Ofc.
Port. Paint, Labor, Pipe
Port. Riggers & Boiler
Port. Weld. & Electric
Port Tool & Bench Storage
Port. Shipfit & Sheet Mtl.
Port. Carp. Hose Shop
Electric Storage
Fab Shop
Repair & Maintenance Bldg.
Government Furnished Material
Security Office
Pipe Storage
X-ray Storage, NDT Office
Pipe Shop
Welding Shop
Front Guard Bldg.
Sheet Metal Office
Lumber Storage
Rigger Shop
Boiler Shop
Machine Shop
Inside Machine Shop
Side Guard Bldg.
Blasting Facility
Unknown Quonset Hut (1982)
Unknown Quonset Hut (1977)
Unknown Quonset Hut (1977)
Unknown
Open Black Beauty Storage Bin
Unknown Small Shed

arney, 1989, updated by ABB-ES, 1994

ACILITY INVESTIGATION
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was also reported to have existed in the southwestern part of JSI (A.T. Kearney, Inc., 1989). The contents of the tank were not known. This circular tank has been removed and its original location is unknown (A.T. Kearney, Inc., 1989).

Abrasive blasting was conducted in the southeastern part of the area using a material called Black Beauty™ (Figure 3-2). The blasting media was used to remove paint from metal objects. At the time of the VSI in 1989, the Black Beauty™ was observed to cover much of the ground over the southern and southeastern parts of JSI (A.T. Kearney, Inc., 1989).

Petroleum fuels were stored in several areas at JSI. Two underground storage tanks (Tanks 1 and 2 in Figure 3-3) with a combined capacity of 3,000 gallons may exist near the location of the machine shop (Building 15) (Figure 3-3) (A.T. Kearney, Inc., 1989). The tanks were used in the 1960's and may have been removed in 1972 during construction of the machine shop (A.T. Kearney, Inc., 1989). No reports have been found concerning the condition of the tanks at removal or if environmental samples were collected during removal of the tanks. In approximately 1989, a 4,000-gallon underground tank (Tank 3 in Figure 3-3) was located next to the transportation shed (Building 25 in Figure 3-3) (A.T. Kearney, Inc., 1989). This tank was reportedly replaced because it was leaking (A.T. Kearney, Inc., 1989). However, no records have been found concerning the collection of environmental samples during the tank removal and replacement action.

Currently, three concrete containment structures exist along the JSI northwestern fenceline (see area referenced as Tank 5 in Figure 3-3). Two of the containment structures are empty and the third holds an aboveground tank labeled "waste-oil." The RFA report indicated that during the VSI in 1989, five aboveground, 500-gallon diesel storage tanks were located in the same approximate area. The RFA also indicated that soil beneath the tanks was stained, which suggests that the five tanks predated the containment structures. No reports have been found that identify the year these five tanks were removed or if environmental samples were collected to assess whether there was a potential release to the environment.

A 55-gallon capacity aboveground storage tank containing fuel oil was reported to exist at the west side of Building 47, the pipe shop (Figure 3-3) (A.T. Kearney, Inc., 1989). Stained soil was also reported to exist beneath the tank. This tank is still located along the west side of building 47.

SWMU 24, NFSI. The NFSI area is approximately 1½ acres and is located along the southern boundary of JSI (Figure 1-2). NFSI is a commercial shipyard company that conducts maintenance and repair operations on Navy ships under contract to the SUPSHIPs. The property where NFSI is located is owned by NAVSTA Mayport and is leased to the company for use in conducting maintenance and repair operations on Navy ships. NFSI has been at this location since approximately 1982. Activities conducted at NFSI are similar to those conducted by JSI, although NFSI operations at NAVSTA Mayport appear to be on a smaller scale.

During the VSI in 1989, approximately 15 55-gallon drums of waste oil and other materials were located in an outdoor area along the northern fenceline on the west side of the NFSI shop building (Figure 3-4) (A.T. Kearney, Inc., 1989). The RFA report did not provide a figure illustrating the location of the drums. One 55-gallon drum used for storage of heating oil was located on the eastern side of the NFSI building. NFSI personnel indicated to A.T. Kearney's personnel

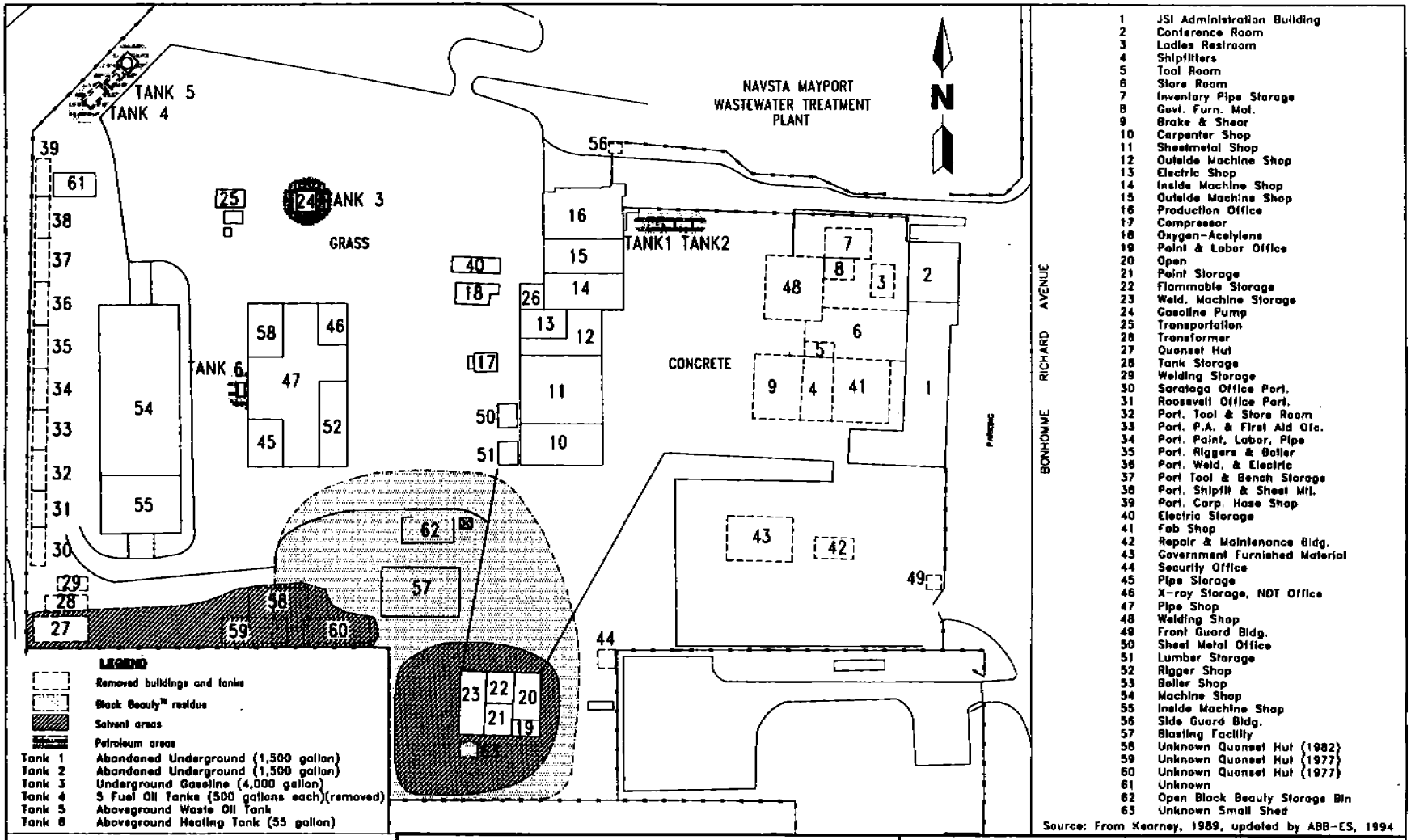

FIGURE 3-3
AREAS OF POTENTIAL CONTAMINATION

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WORKPLAN, ADDENDUM 5

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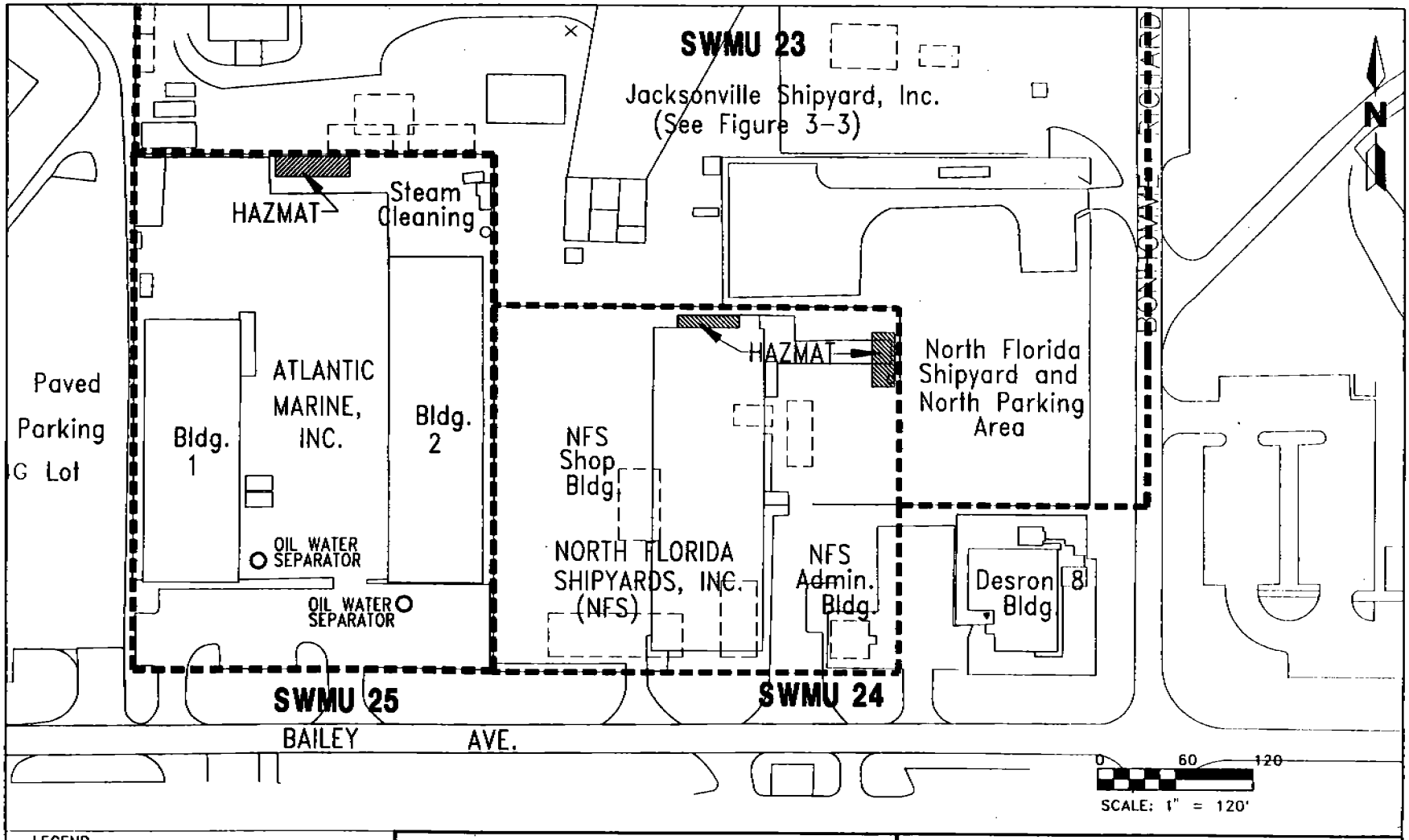

FIGURE 3-4
SWMU 24, NORTH FLORIDA SHIPYARD, INC., AND SWMU 25, ATLANTIC MARINE, INC.

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

during the VSI that the contents of the drums were unknown and that the drums had been stored there for at least 5 years. However, NFSI personnel reported that analyses were being performed on the unknown material in the drums to identify appropriate disposal methods (A.T. Kearney, Inc., 1989). The results of the analyses of the materials in the drums and the disposal methods are unknown.

Currently, NFSI has a hazardous waste storage shed located along the central part of the fence to the north of the NFSI Administration Building. The shed has a concrete floor and a berm (curb) to contain accidental spills.

Aerial photographs were reviewed during the preparation of this workplan to identify other possible areas that may be of potential concern at SWMU 24. (USDA, 1952; 1960; 1969; 1970; 1972; 1975; 1980; 1982; 1983; and 1989). Interpretation of an aerial photograph dated 1977 suggests that a berm structure was formerly located to the south of the NFSI's southern parking lot. The berm structure was likely the backstop for the former NAVSTA Mayport small arms range (Figure 3-5). Another berm or trench also was interpreted to exist in the northwestern part of the NFSI site to the west of the NFSI shop building. An aerial photograph dated 1982 suggests that five buildings were removed prior to the construction of NFSI's shop building (Figure 3-4).

SWMU 25, AMI. The AMI area encompasses approximately 1½ acres and is located on the southern boundary of JSI and the western boundary of NFSI (Figure 1-2). AMI is a commercial shipyard company that conducts maintenance and repair of Navy ships under contract to the SUPSHIPs. The property where AMI is located is owned by NAVSTA Mayport and leased to AMI for use in carrying out maintenance and repair operations. AMI has been in this location since approximately 1980. Activities conducted at AMI are similar to those conducted at NFSI and JSI.

The RFA report (A.T. Kearney, Inc., 1989) indicated that during the VSI, a build-up of abrasive blasting media, Black Beauty™, was noted on the asphalt in the northeastern corner of the AMI site. The exact area of the build-up of Black Beauty™ was not depicted in the RFA report. Additionally, stained soil was noted at the location of AMI's hazardous waste and waste oil accumulation area (A.T. Kearney, Inc., 1989). Spent solvents, paint wastes, and used or contaminated oil products were stored on an asphalt-covered area (accumulation area north of the AMI buildings), where access was restricted with a chain (A.T. Kearney, Inc., 1989).

Currently, AMI stores drummed paints and solvent material in a shed located along the northern property fence line, in the same area as the 90-day hazardous waste accumulation area. A below grade trench drain and aboveground tank, which collects steam cleaning waste, are located at the northeastern corner of the AMI site.

Two oil-water separators are present at the AMI site; however, neither is currently being used. Both oil-water separators are connected from Buildings 1 and 2 by underground pipes to underground sumps and waste oil accumulation tanks.

A review of aerial photographs dated from the mid 1960's to late 1970's suggests the occurrence of extensive areas of disturbed vegetation and soil in the southwestern parts of the AMI site and adjacent areas next to the site's western boundary (Figure 3-5). The disturbed area would includes the paved parking lot adjacent to the western property boundary of AMI. Some of the disturbed areas

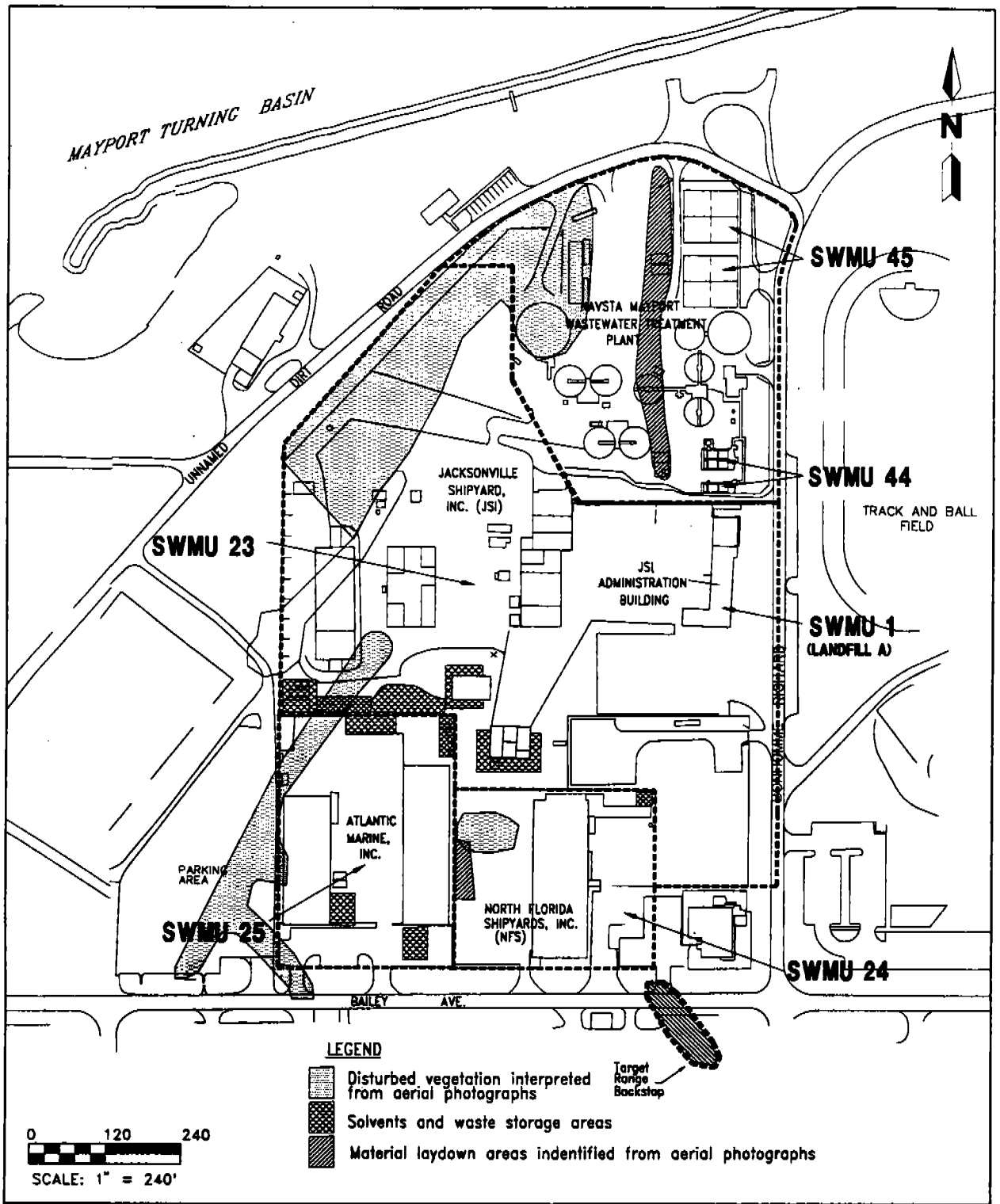

FIGURE 3-5
SWMUs 1, 23, 24, 25, 44, and 45,
AREAS OF POTENTIAL CONTAMINATION

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U.S. NAVAL STATION MAYPORT, FLORIDA

could be from vehicular traffic using a dirt road located in the southwestern corner of the AMI site. It could not be confirmed from the review of the aerial photographs, but this area may have been used as either a laydown yard or possibly a landfill.

SWMU 44, Wastewater Treatment Facility Clarifiers 1, 2, and 3. Wastewater treatment facility clarifiers 1 and 2 were constructed in 1962 and clarifier 3 was added in the 1970's as part of the NAVSTA Mayport WWTP. The clarifiers are located east of and within 500 feet of Mayport Turning Basin along the northern boundary of JSI (Figure 1-2). The clarifiers are aboveground, square concrete tanks each having a nominal capacity of approximately 40,500 gallons (Figure 3-6).

The RFA report indicated that during the VSI in 1989, clarifiers 1, 2, and 3 were reported to have oily stains on the outside of the tanks. The staining was reported to be along the location of small "hairline" fractures. Based on the appearance of the clarifiers, A.T. Kearney concluded that some oily material may have been released around each clarifier.

Beginning in 1987, the clarifiers were used to contain and remove floating free-phase oil from fire-fighting training wastes from the FTC and effluent from these tanks was discharged into the WWTP influent stream (A.T. Kearney, Inc., 1989). The floating free-phase oil was manually skimmed from the surface and transported by gravity flow into one of the Group IV, SWMU 51, waste oil storage tanks (A.T. Kearney, Inc., 1989).

Currently, the clarifiers are being used for temporary storage of fire-fighting training waste liquids from the FTC. The fire-fighting training wastes are stored in the clarifiers prior to treatment at the Oily Waste Treatment Plant (OWTP) (Group II SWMU 9). Effluent from the OWTP is returned to the WWTP.

SWMU 45, Wastewater Treatment Facility Sludge Drying Beds. The NAVSTA Mayport wastewater treatment facility was expanded in 1972 to include a secondary treatment facility using an activated sludge system and two sludge drying beds each divided into four cells (Figure 3-6). The sludge beds, each comprised of four cells, have an area of approximately 14,000 square feet. The RFA report indicated that the sludge drying beds are constructed with concrete curbs and sand bottoms and were reported to have received digested sludge from aerobic digesters 1 and 2 (Figure 3-7) (A.T. Kearney, Inc., 1989). During sludge drying, the effluent that passed through the sand bottom was collected by an underdrain system, which flowed to the influent pumping station (A.T. Kearney, Inc., 1989). However, anecdotal evidence from NAVSTA Mayport personnel at the WWTP indicate that the underdrain system does not exist. Between 1972 and 1985, the sludge drying beds were cleaned once every quarter, with the dewatered sludge disposed in the onsite landfills (Group I SWMUs 2 through 5) (A.T. Kearney, Inc., 1989). The sludge drying beds were replaced in 1985 with a vacuum dewatering filter press. The dried material is taken offsite for disposal (Figure 3-6). The sludge drying beds have not been used for dewatering since 1985; however, when dumpsters at NAVSTA Mayport's WWTP have been full, the sludge beds have been used as a temporary storage area.

3.1.2 Summary of Previous Investigations During the ESI in 1988, three monitoring wells were installed around the perimeter of SWMU 1, Landfill A, to collect the following: information on the subsurface lithology, information on

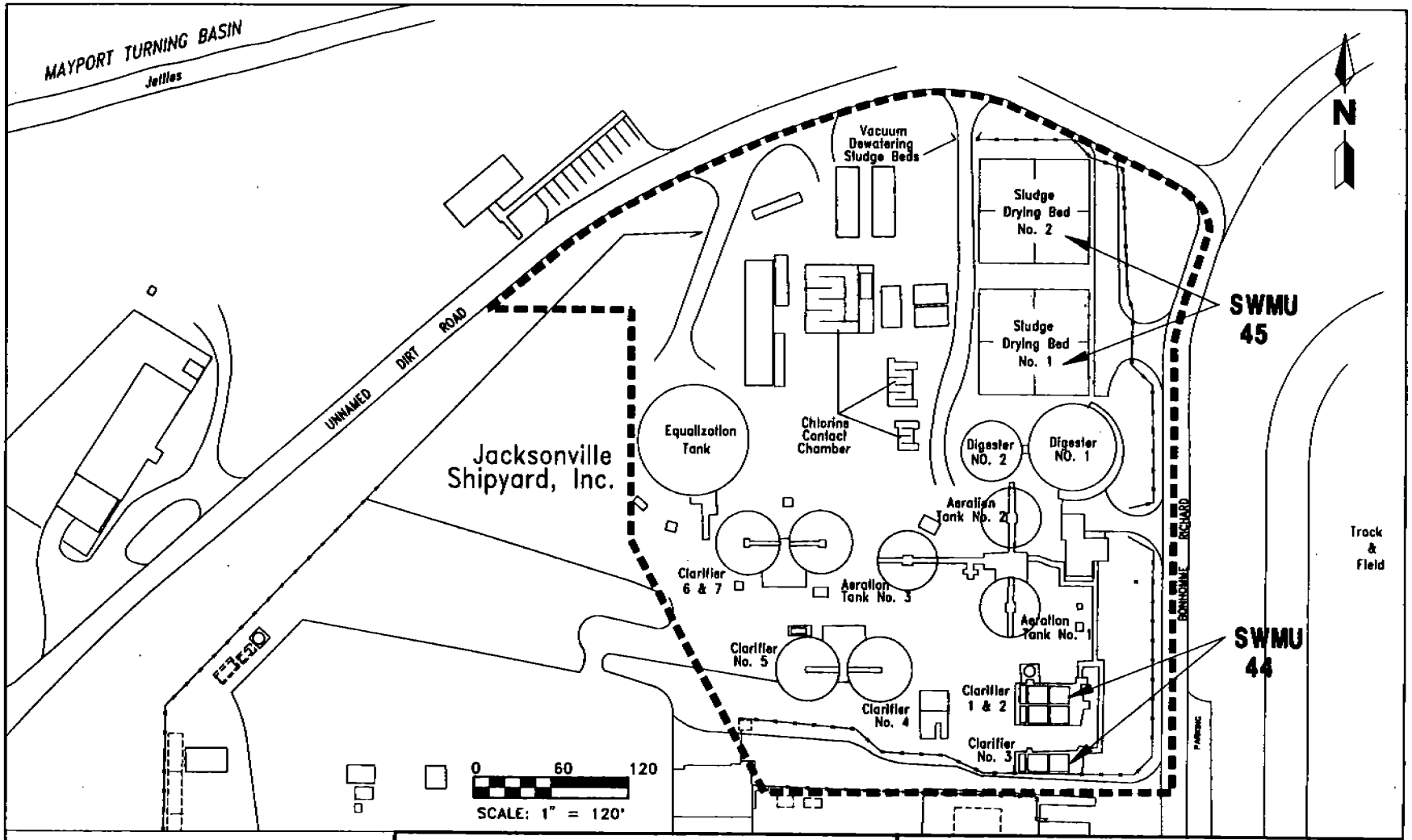

FIGURE 3-6
NAVSTA MAYPORT
WASTEWATER TREATMENT PLANT,
AND SWMUs 44 AND 45

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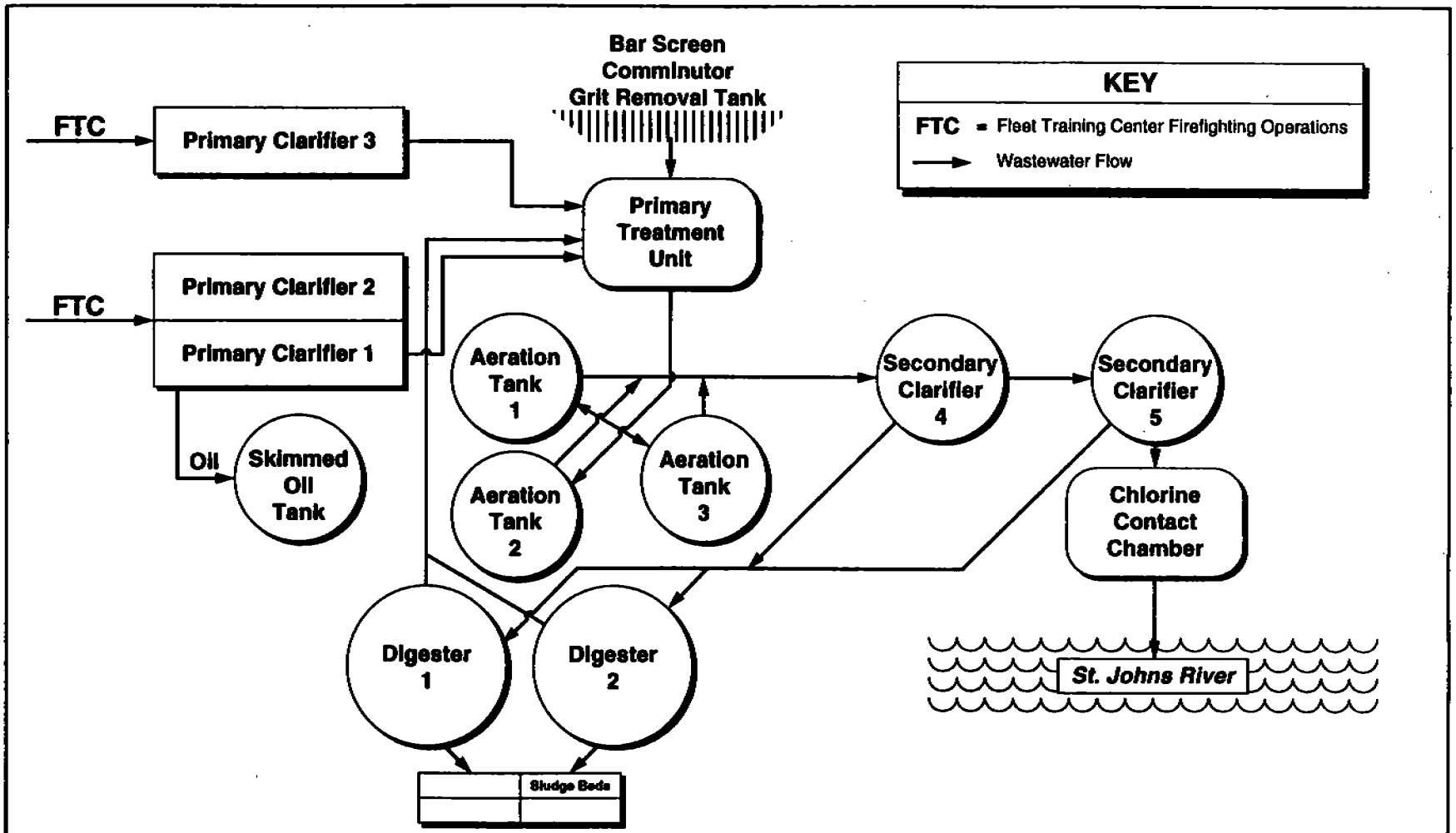

FIGURE 3-7

WASTEWATER TREATMENT FACILITY
PROCESS FLOW DIAGRAM

Source: A.T. Kearney, 1989
modified by ABB-ES

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the hydraulic properties of the surficial aquifer, and soil and groundwater samples for laboratory analyses (E.C. Jordan, 1988). The soil samples were collected immediately above the saturated zone and the groundwater samples were collected from wells screened across the water table (E.C. Jordan, 1988).

Three monitoring wells (MPT-1-1, MPT-1-2, and MPT-1-3) were installed in the vicinity of SWMU 1 (Figure 3-8) during the ESI (E.C. Jordan, 1988). Soil and groundwater samples were collected from the location of each of the monitoring wells and analyzed for priority pollutants. 4,4'-dichlorodiphenyldichloroethene (DDE) was detected in the groundwater sample from monitoring well MPT-1-2 at a concentration of 0.01 micrograms per liter ($\mu g/\ell$) and in both the soil and groundwater sample from monitoring well MPT-1-3 at concentrations of 58 micrograms per kilogram ($\mu g/kg$) and 0.14 $\mu g/\ell$, respectively. Lead was detected at a concentration of 122 $\mu g/\ell$ in the groundwater sample from monitoring well MPT-1-3.

The ESI report indicated that the shallow surface soil consists mainly of fine-grained quartz sands. A thin clay layer (less than 1 foot thick) was found at the location of each boring at approximate depths of 7 to 10 feet bls. The ESI report indicated that the clay layer appeared to slope downward toward the St. Johns River (E.C. Jordan, 1988). Below this clay layer were fine-grained quartz sands to the explored depths of 17 feet bls (E.C. Jordan, 1988). Groundwater level measurements collected on October 8, 1987, during the ESI suggest an average horizontal hydraulic gradient of 0.004 foot per foot (ft/ft) across the site (E.C. Jordan, 1988). The direction of groundwater flow was determined to be toward the north in the direction of the St. Johns River, which is located approximately 400 feet from the northern boundary of SWMU 1.

Because the Navy plans to renovate the JSI Administration Building for occupancy by the NAVSTA Mayport Public Works Department, a special-purpose investigation was conducted in the vicinity of the JSI Administration Building. The special-purpose investigation included collecting surface and subsurface soil samples (ABB-ES, 1994c). Analytical results from the soil samples were used to assess whether contamination of soil may present a long-term health threat to the NAVSTA Mayport employees who will work in the JSI Administration Building and to construction workers onsite during remodeling of the JSI Administration Building.

The special-purpose investigation, which included two surface soil sampling events, was performed at SWMU 1 on July 7 and 8, 1993, and December 1 and 2, 1993. The first sampling event consisted of collecting composite surface soil samples from the following JSI areas: Administration Building and adjacent grounds, parking lot south of the Administration Building, shop and warehouse area west of the Administration Building, and a grassy area west of the WWTP. In addition, surface and subsurface soil samples were collected from around the JSI Administration Building. The soil samples were analyzed for a selected subset of 40 Code of Federal Regulations, Part 264, Appendix IX, groundwater monitoring list parameters (USEPA, 1986). Figure 3-9 illustrates the sampling location and Tables 3-1 and 3-2 present the concentrations of detected target analytes for the surface and subsurface samples, respectively.

Because the highest detected concentrations of lead and mercury could potentially present an unacceptable exposure risk to a construction worker at the JSI Administration Building site, a second sampling event was conducted. The objective of the second sampling event was to assess whether the observed

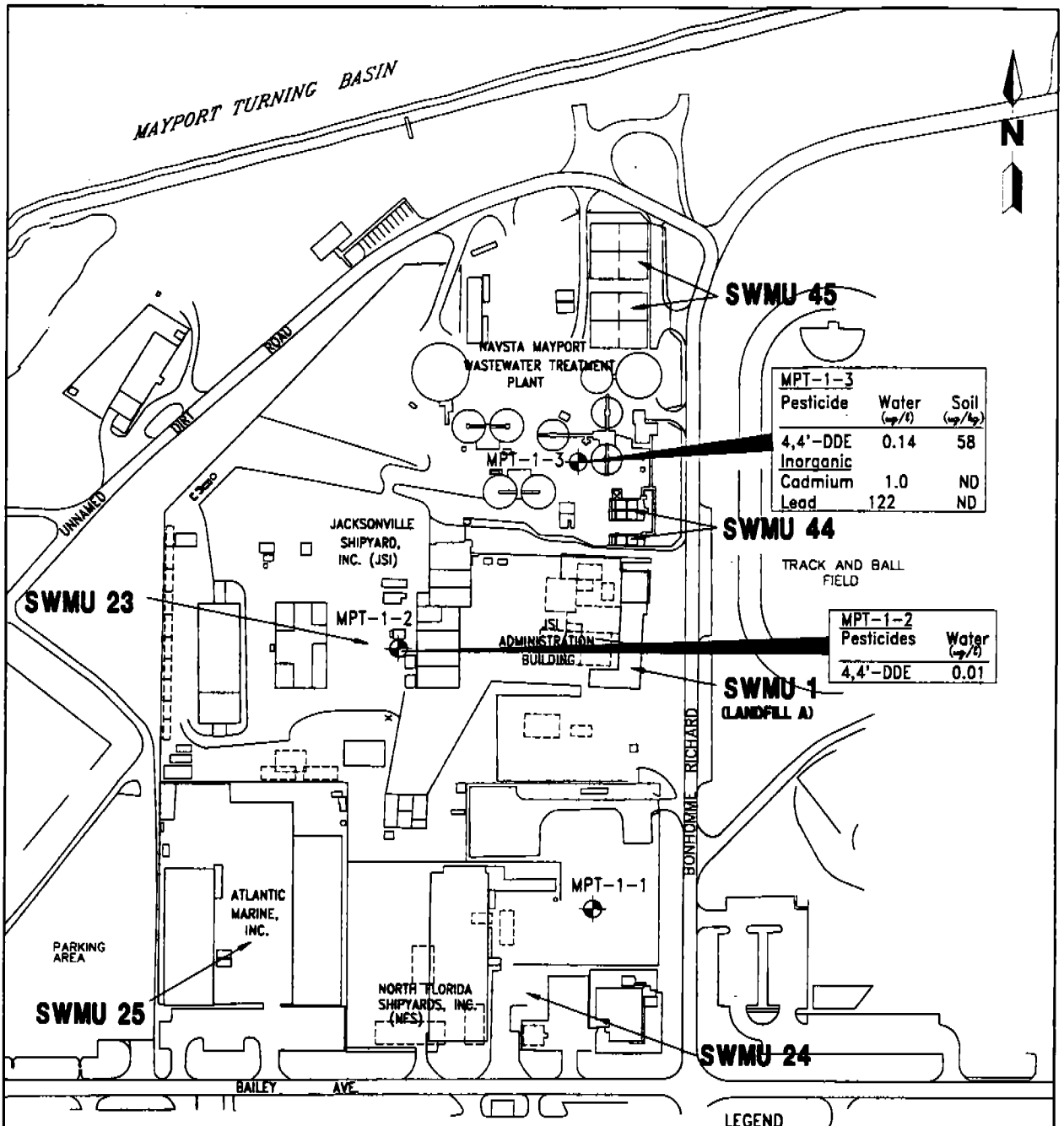

FIGURE 3-8
EXPANDED SITE INVESTIGATION, SWMU 1 LANDFILL

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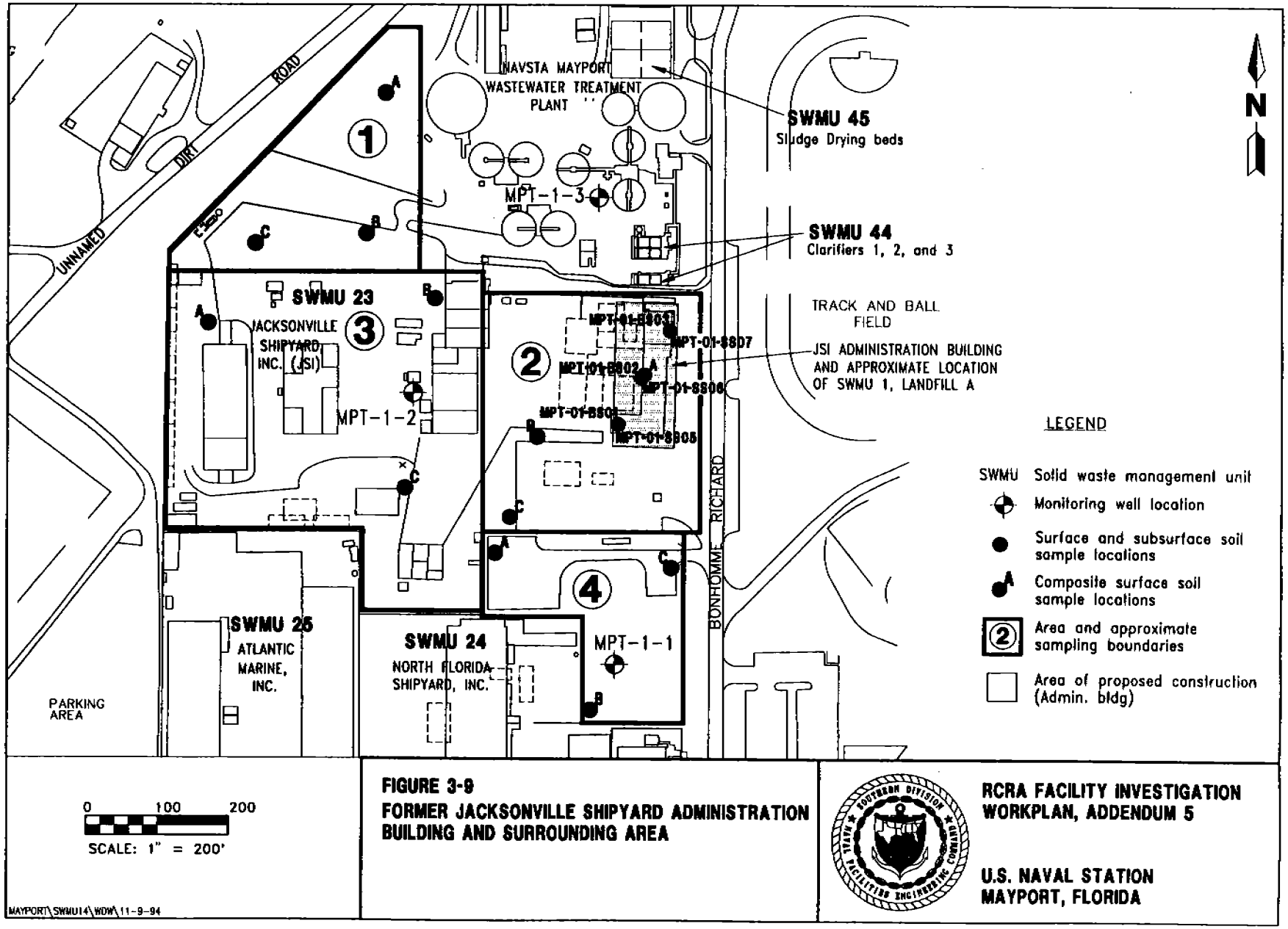

FIGURE 3-9
FORMER JACKSONVILLE SHIPYARD ADMINISTRATION BUILDING AND SURROUNDING AREA

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Table 3-1
Analytical Results for Surface Soil Samples, Jacksonville Shipyard Administration Building Area

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

CAS RN	Analyte	Unit	MPT-1-SS01	MPT-1-SS02	MPT-1-SS03	MPT-1-SS04	MPT-1-SS05	MPT-1-SS06	MPT-1-SS07
Semivolatile Organic Compounds									
84-74-2	Di-n-butylphthalate	µg/kg	340 U	340 U	340 U	340 U	170 BJ	170 BJ	240 BJ
205-99-2	Benzo(b)fluoranthene	µg/kg	37 J	94 J	340 U	340 U	350 U	360 U	340 U
207-08-9	Benzo(k)fluoranthene	µg/kg	340 U	78 J	340 U	340 U	350 U	360 U	340 U
218-01-9	Chrysene	µg/kg	340 U	73 J	340 U	340 U	350 U	360 U	340 U
206-44-0	Fluoranthene	µg/kg	64 J	170 J	340 U	340 U	350 U	360 U	340 U
85-01-8	Phenanthrene	µg/kg	340 U	54 J	340 U	340 U	350 U	360 U	340 U
129-00-0	Pyrene	µg/kg	53 J	130 J	340 U	340 U	350 U	360 U	340 U
Pesticides									
12672-29-6	Aroclor-1248	µg/kg	1,500 P	34 U	34 U	34 U	34 U	85 U	88 U
11096-82-5	Aroclor-1260	µg/kg	140 U	34 U	34 U	34 U	34 U	150 P	200
Metals									
7440-38-2	Arsenic	mg/kg	1.4 B	3.0	1.8 B	0.6 U	1.2 B	1.7 B	2.0 B
7440-39-3	Barium	mg/kg	5.1 B	381	24.9 B	6.5 B	4.4 B	31.6 B	12.0 B
7440-43-9	Cadmium	mg/kg	0.70 U	0.72 B	0.70 U	0.70 U	0.71 U	1.3	1.4
7440-47-3	Chromium	mg/kg	5.7	27.4	11.8	4.9	4.4	26.9	16.3
7440-92-1	Lead	mg/kg	9.4	80.7	66.0	8.6	39.4	90.0	110.0
7440-97-6	Mercury	mg/kg	0.02 U	0.05	0.04 B	0.02 U	0.02 U	0.06	525.0
7440-49-2	Selenium	mg/kg	0.81 B	0.44 B	0.34 U	0.34 U	0.61 B	0.34 U	0.36 U
7440-22-4	Silver	mg/kg	0.87 U	0.89 U	0.86 U	0.86 U	0.88 U	1.0 B	1.4 B

Notes: These data have not been validated.
All analytes were collected from 0- to 1-foot below land surface.

CAS RN = chemical abstract service registry number.
µg/kg = micrograms per kilogram.
U = not detected at concentrations greater than the contract required quantitation limit.
BJ = target analyte detected in associated quality control sample, therefore, the concentration is estimated.
J = estimated value that is less than the contract required quantitation limit and greater than the instrument detection limit.
B = inorganic analytical result is less than the contract required detection limit and greater than the instrument detection limit.
P = the percent difference between the analytical results for two separate gas chromatograph columns was greater than 20 percent on pesticides and polychlorinated biphenyl analysis.
mg/kg = milligrams per kilogram.

Table 3-2
Analytical Results for Subsurface Soil Samples, Jacksonville Shipyard Administration Building Area

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

CAS RN	Analyte	Unit	MPT-1-BS01	MPT-1-BS02	MPT-1-BS03	MPT-1-BS03DUP
67-64-1	Acetone	µg/kg	11 U	6 BJ	9 BJ	8 BJ
84-74-2	Di-n-butylphthalate	µg/kg	160 BJ	220 BJ	290 BJ	300 BJ
7440-38-2	Arsenic	mg/kg	1.0 B	1.5 B	1.3 B	0.88 B
7440-39-3	Barium	mg/kg	5.0 B	9.6 B	4.9 B	6.8 B
7440-43-9	Cadmium	mg/kg	0.72 U	0.73 U	0.71 U	0.71 U
7440-47-3	Chromium	mg/kg	2.2	14.6	2.4	4.7
7440-92-1	Lead	mg/kg	0.73 U	16.8	12.2	8.7
7440-97-6	Mercury	mg/kg	0.02 U	0.02 U	0.33	0.29
7440-49-2	Selenium	mg/kg	0.35 U	0.36 U	0.58 B	0.65 B
7440-22-4	Silver	mg/kg	0.89 U	0.91 U	0.88 U	0.87 U

Notes: These data have not been validated.
All analytes were collected from 3- to 4- foot below land surface.

CAS RN = chemical abstract service registry number.
µg/kg = microgram per kilogram.
U = not detected at concentration greater than the contract required quantitation limit.
BJ = target analyte detected in associated quality control sample, therefore, the concentration is estimated.
B = inorganic analytical result is less than the contract required detection limit and greater than the instrument detection limit.
mg/kg = milligram per kilogram.

concentrations of lead and mercury represented an isolated occurrence or were indicative of a larger contaminated area (ABB-ES, 1994c). Figure 3-10 illustrates the location of the soil samples collected during the second sampling event and Table 3-3 presents the concentrations of detected target analytes (ABB-ES, 1994c). The analytical results from the second sampling event suggest that the highest detected concentrations of lead and mercury were isolated occurrences.

The analytical results for the special-purpose investigation have not been validated and are, therefore, subject to qualification (ABB-ES, 1994c).

3.1.3 Rationale for Sampling Activities SWMU 1 and the adjacent SWMUs (23, 24, 25, 44, and 45) contain several potential sources of contamination. These SWMUs are in the proximity of SWMU 1, Landfill A; share a similar hydrogeologic setting; and may have some similar contaminants. The six SWMUs have been grouped to facilitate a comprehensive approach to the investigation consisting of the collection of environmental samples at locations where potential contaminants may emanate from multiple sources with overlapping contaminant plumes. Potential contaminants from these SWMUs include petroleum fuels and oils, PCBs, chlorinated solvents, non-chlorinated solvents, paint wastes, and metals. Figures 3-1 and 3-3 through 3-6 illustrate the locations of potential sources of contamination at SWMUs 1, 23, 24, 25, 44, and 45.

Proposed field investigative activities at the SWMUs include a geophysical survey, a groundwater screening program, a surface and subsurface soil sampling program, and monitoring well installation and groundwater sampling program. Table 3-4 provides a summary of the number of samples to be collected by media and Table 3-5 provides a summary of samples by analytical methodology. Environmental samples will be analyzed using Naval Energy and Environmental Support Activity (NEESA) Level C, D, and E sampling and analytical techniques to meet the data quality objectives (DQOs). The following sections describe the proposed field investigative activities and laboratory analytical methods for environmental samples collected at SWMUs 1, 23, 24, 25, 44, and 45.

Geophysical Survey. A geophysical survey will be conducted in open areas where landfilled materials are suspected to be present in and around SWMU 1. The purpose of the geophysical survey is to identify areas where buried materials may exist and to delineate the boundaries of Landfill A if possible. Information gathered during the geophysical survey will be used in the design of a monitoring well network. Three geophysical survey methods will be used including terrain conductivity instrumentation, magnetometer, and ground penetrating radar.

A grid with 50-foot spacing will be surveyed in open spaces adjacent to the JSI Administration Building, the western part of the JSI, the western part of the WWTP, an open area to the east of AMI, and the parking lot area next to SWMU 25 (Figure 3-11). Geophysical measurements will be collected from each intersecting node. Boundaries of any anomaly detected during the geophysical survey will be delineated by taking additional measurements while traveling north to south or east to west around the anomaly. The boundary of an anomaly will be staked and a Florida-licensed surveyor will accurately survey the location(s).

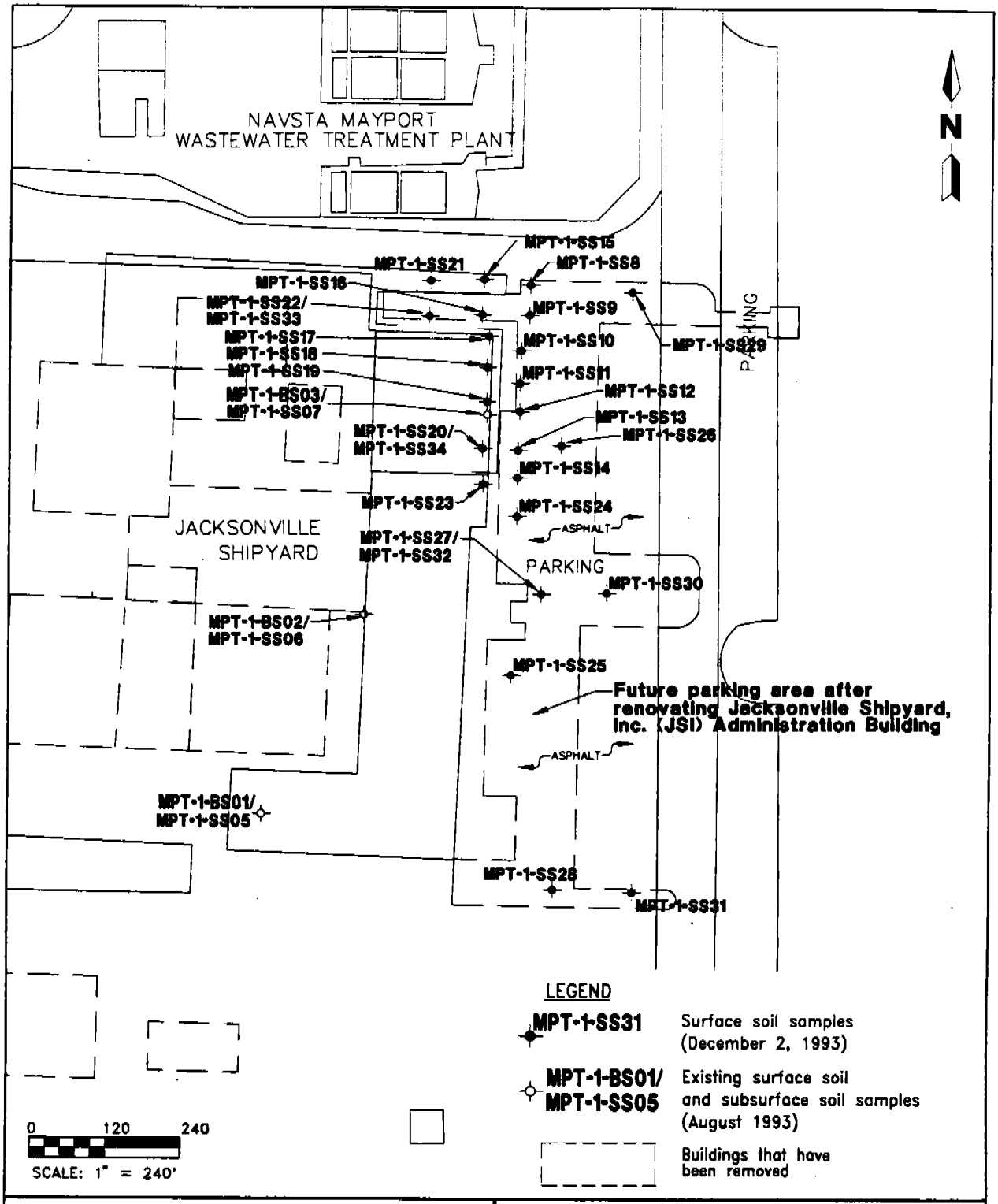

FIGURE 3-10
SURFACE AND SUBSURFACE SOIL SAMPLING LOCATIONS

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RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

Table 3-3
Analytical Results for Surface Soil Samples, December 1993, Jacksonville Shipyard Administration Building Area

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Sample Location	CAS RN and Analyte						
	7440-92-1 Lead (mg/kg)	7440-97-6 Mercury (mg/kg)	11096-82-5 Aroclor-1260 (µg/kg)	12672-29-6 Aroclor-1248 (µg/kg)	57-4-9 Chlordane (µg/kg)	72-55-9 4,4'-DDE (µg/kg)	50-29-3 4,4'-DDT (µg/kg)
MPT-01-SS8	55.8	0.09 B	16 J	–	–	8.0	3.1
MPT-01-SS9	17.5	0.08 B	17 J	–	–	1.7	–
MPT-01-SS10	16.3	3.8	49	–	9.6	3.1	1.2 J
MPT-01-SS11	34.8	0.19	79	–	5.3 J	3.2	1.3
MPT-01-SS12	339.0	0.34	33	–	–	2.9	1.4
MPT-01-SS13	12.6	0.12	40	–	–	2.3	1.5
MPT-01-SS14	3.7	0.06 U	–	–	–	–	–
MPT-01-SS15	88.9	0.11	96	–	20	2.9	–
MPT-01-SS16	57.9	0.82	72	–	–	0.99 J	–
MPT-01-SS17	4.5	0.07 B	–	–	12	–	–
MPT-01-SS18	7.2	0.21	22	–	20	0.82	–
MPT-01-SS19	6.5	0.09 B	–	–	6.3 J	–	–
MPT-01-SS20	33.5	0.68	65	–	–	–	–
MPT-01-SS21	28.6	0.09	75	–	–	1.4	2.8
MPT-01-SS22	12.2	0.09 B	–	540	–	–	–
MPT-01-SS23	80.4	0.32	210	–	33 J	5.7	–
MPT-01-SS24	9.9	0.1	17 J	–	–	1.9	–
MPT-01-SS25	46.2	0.07 B	25	–	–	–	–
MPT-01-SS26	165	0.08 B	32 J	–	–	18	5.7
MPT-01-SS27	16.9	0.1 B	–	–	–	9.9	2.0 J
MPT-01-SS28	10.7	0.09	–	–	–	0.75	–
MPT-01-SS29	3	0.06 U	–	–	–	–	–
MPT-01-SS30	13.4	0.06 U	32 J	–	–	21.0	12
MPT-01-SS31	3.2	0.06 U	–	–	–	–	–
MPT-01-SS32	17.8	0.22	11 J	–	–	9.8	3.0
MPT-01-SS33	11.6	0.08 B	–	260	–	–	–
MPT-01-SS34	29.1	0.55	57	–	–	–	–

Notes: These data have not been validated.
All analytes were collected from 0 to 1 foot below land surface.
CAS RN = chemical abstract service registry number.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
mg/kg = milligrams per kilogram.
µg/kg = micrograms per kilogram.
B = inorganic analytical result is less than the contract required detection limit and greater than the instrument detection limit.
J = estimated value that is less than the contract required quantitation limit and greater than the instrument detection limit.
U = not detected at concentrations greater than the contract required quantitation limit.

Table 3-4
Summary of Environmental and Quality Control Samples by Medium

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

SWMU Number	Screening Groundwater	Surface Soil	Soil Boring[1]	Composited Soil	Sediment	Surface[2] Water	Groundwater[3]
1 and 23	41	39	20				10
24	4	6	2				3
25	6	10	2				1
44	2	8					1
45	4	9	4	16			3
TBD	20	21	40				8
Field QC	30	36	30	6			12
Subtotal	107	129	98	22			38
14	17	25	16		8	8	10
18	3	1	2		3	3	1
TBD	15	14	12				6
Field QC	14	14	10		6	6	12
Subtotal	45	49	40		17	17	29
17		15	3				3
TBD							
Field QC		5	5				5
Subtotal		20	8				8
Total	152	198	246	22	17	17	75

[1] One surface and two subsurface soil samples will be collected at each soil boring or monitoring well cluster.
[2] Surface water sample to be collected if standing water is present in tidal areas or in the drainage ditch.
[3] Groundwater samples include the number of shallow, intermediate, and Hawthorn Group monitoring wells per SWMU.

Notes: SWMU = solid waste management unit.
TBD = to be determined based on groundwater field screening or geophysical survey results.
Field QC = field quality control includes equipment rinsate blanks, source water blanks, matrix spikes, matrix spike duplicates, and sample duplicates.

Table 3-5
Summary of Environmental Samples by Analytical Parameters

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

SWMU Number	Sample Type	Number of Samples	Sample Depth (feet bls)	USEPA Method Number for Analyte(s)						
				8240 VOC	8270 SVOC	6010, 7470, 7480 Metals	901 Cyanide	8080 Pest/PCBs	8010/8020 VOC	[1]8015 Petroleum
SWMUs 1, 23, 24, 25, 44, and 45	Screening of groundwater	114	10						*	*
	Surface soil samples	97	0 to 1	*	*	*	*	*		
	Subsurface soil samples[2]	51	Vadose zone	*	*	*	*	*		*
	Composite soil samples	22	0 to 2	*	*	*	*	*		
	Groundwater samples	35	78	*	*	*	*	*		*
SWMUs 14 and 18	Screening of groundwater	49	10						*	*
	Surface soil samples	35	0 to 1	*	*	*	*	*		*
	Subsurface soil samples	72	Vadose zone	*	*	*	*	*		
	Surface water and sediment samples	34	0 to 1	*	*	*	*	*		
	Groundwater samples	29	>8	*	*	*	*	*		*
SWMU 17	Surface soil samples	16	0 to 1	*	*	*	*	*		*
	Subsurface soil samples	9	0 to 15	*	*	*	*	*		*
	Groundwater samples	9	>8	*	*	*	*	*		*

[1] Method 8015; chromatogram provides a fingerprint characterization of the petroleum constituents.
[2] Included surface and subsurface soil samples.

Notes: SWMU = solid waste management unit.
feet bls = feet below land surface.
USEPA = U.S. Environmental Protection Agency.
VOC = volatile organic compounds.
SVOC = semivolatile organic compounds.
Pest/PCBs = pesticides and polychlorinated biphenyls.
* = analysis to be conducted.

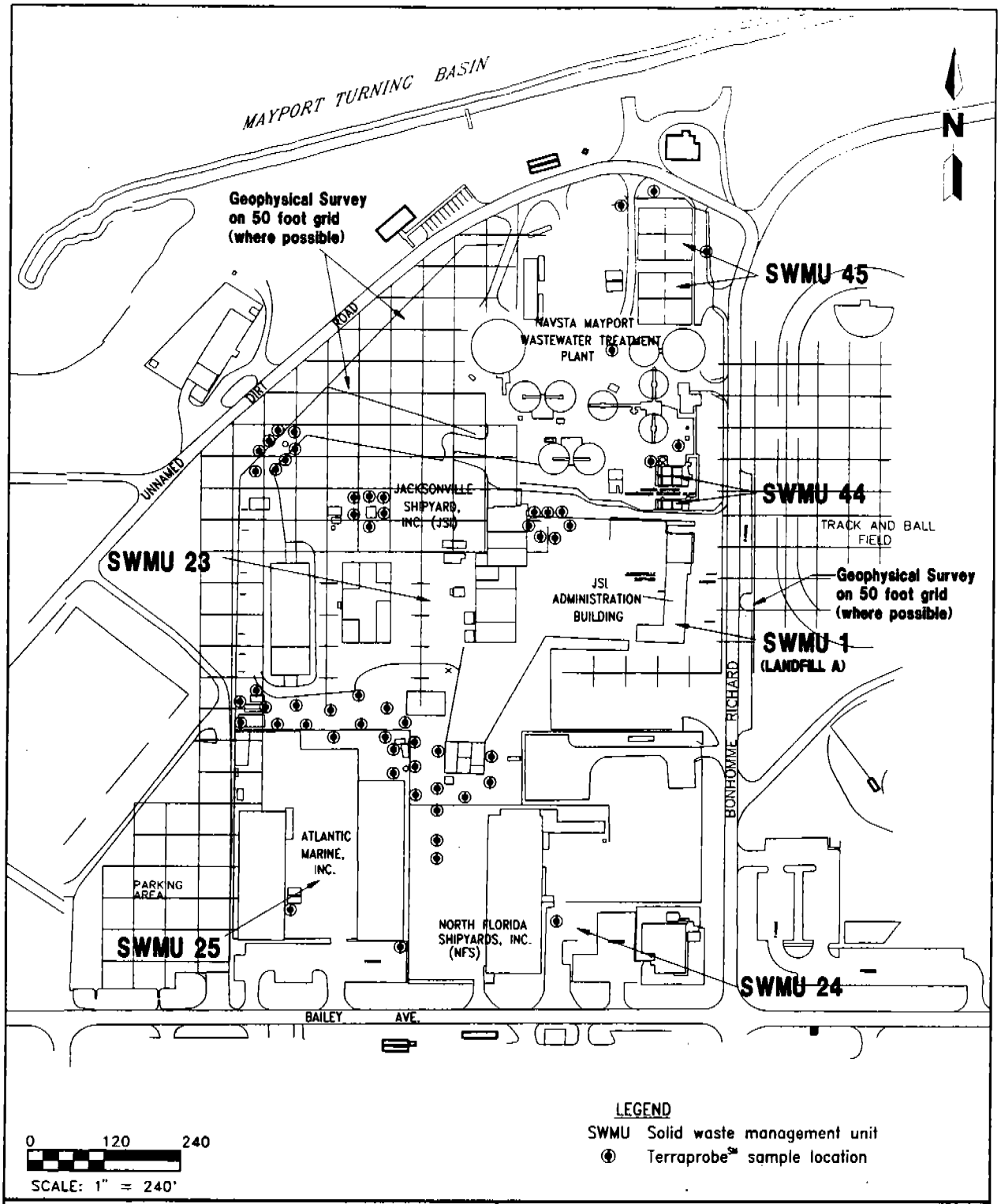

FIGURE 3-11
PROPOSED GEOPHYSICAL SURVEY GRID AND TERRAPROBE℠ SAMPLING LOCATIONS

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U.S. NAVAL STATION MAYPORT, FLORIDA

A Geonics Limited EM-31 terrain conductivity instrument (or equivalent) will be used in conjunction with a Proton Precision Magnetometer (or equivalent). This instrument combination provides a means of assessing buried materials that may have electrical and magnetic properties that are markedly different from the surrounding subsurface soil, sediment, and groundwater and, thus, are detected as anomalies. It should be noted that the EM-31 survey may be affected by the concentration of chloride naturally existing in the groundwater, and the buried materials may not present sufficient contrast to be detected. Depending on site conditions, a ground penetrating radar may be used to assess anomalies detected by either the terrain conductivity instrument or the magnetometer. If the ground penetrating radar is not successful in determining the nature of the anomaly, an auger boring may be conducted to intrusively assess the anomaly. Five borings are estimated with locations to be determined after review of the geophysical data. Soil samples will be collected from these borings at the following intervals: land surface to a depth of 1 foot bls, a 1-foot interval immediately above the water table, and in areas where the water table is greater than 8 feet bls, a subsurface soil sample will be collected from a 1-foot interval that has the highest organic vapor analyzer (OVA) measurement based upon field screening or as a default approximately halfway between the land surface and the water table.

Groundwater Field Screening Program. A groundwater field screening program is proposed to collect groundwater samples in areas that once were used to store petroleum fuels and/or solvents. The groundwater field screening program will be an iterative process designed to assess whether petroleum-related or solvent contamination is present and to delineate any contamination that is found. The groundwater field screening program also will be used to assist in determining the location of groundwater monitoring wells. Based on the results of the field screening program, confirmatory samples (soil and groundwater) will be collected to assess contaminant fate and transport, human health and ecological risk, and to provide fundamental engineering properties data to support development of potential corrective measures.

A minimum of 57 direct push technology soundings are proposed to collect the groundwater field screening samples (Figure 3-11). Approximately 20 additional groundwater field screening samples are proposed, with locations to be determined in the field based on professional judgment, to delineate contamination discovered during the field screening program. The 20 additional sampling locations will be identified after reviewing analytical results of the initial 57 sampling locations.

Analyses of groundwater field screening samples will be performed using a field gas chromatograph (GC) with 10 percent laboratory confirmation by USEPA Methods 8010 and 8020. The DQO for the groundwater field screening sample level of accuracy will be NEESA Level E (USEPA DQO Level 2). This DQO was selected because the purpose of this screening program is to assist in locating monitoring wells from which confirmatory groundwater samples will be collected.

Surface and Subsurface Soil Sampling Program. Sixteen composited soil samples will be collected from SWMU 45, Sludge Drying Beds. Each quadrant of each sludge drying bed will have two composite samples collected, one from each of two distinct depth intervals. The first composite sample depth interval will be from the surface of the sludge drying bed to a depth of 1 foot; the second composite sample depth interval will be from 1 to 2 feet bls. At each quadrant of the

sludge drying bed, five individual samples from the same depth interval will be composited into a single sample. The five individual samples will form the pattern of a number 5 dice, one in the center of each quadrant with one sample near each corner of the quadrant. Surface soil sampling locations will be biased to worst case location (e.g., stained areas, low areas where ponding occurs, etc.).

Fifty-nine surface soil samples will be collected from locations that were once used as laydown yards, for storage of hazardous materials, or as sand blasting or painting areas (Figure 3-12).

Surface and subsurface soil samples will be collected from seven boring locations at the former JSI Administration Building and each proposed monitoring well or well nest location adjacent to SWMUs 1, 23, 24, 25, 44, and 45 (Figure 3-13). The purpose of these subsurface soil samples will be to assess whether there has been a contaminant release from these SWMU's. Ten additional boring locations may be selected, based on results of the geophysical survey and groundwater field screening results. Surface and composited soil samples will be submitted for laboratory analysis. The parameters to be analyzed include target analytes selected from both the Groundwater Monitoring List contained in 40 CFR 264, Appendix IX, and USEPA's Contract Laboratory Program target compound list and target analyte list. These target analytes are described in Chapter 4.0, Analytical Program. Soil samples will be collected at the following intervals: land surface to a depth of 1-foot bls, a 1-foot interval immediately above the water table, and in areas where the water table is greater than 8 feet bls, a subsurface soil sample will be collected from a 1-foot interval that has the highest OVA measurement based upon field screening or as a default approximately halfway between the land surface and the water-table. Subsurface soil samples will be analyzed for selected Appendix IX Groundwater Monitoring List parameters.

In addition, 10 subsurface soil samples will be collected during drilling of the monitoring wells and analyzed for general physical and chemical properties. The soil samples will be collected at locations to be selected in the field to assess the variability of soil properties in the vicinity of SWMUs 1, 23, 24, 25, 44, and 45. These physical and chemical properties will include bulk density, cation exchange capacity, organic content, soil Ph, particle-size distribution, moisture content, and infiltration. Properties of porosity and soil sorptive capacity will be derived from these basic physical and chemical properties. These parameters will be used to assess contaminant fate and transport and human health and ecological risk and will provide fundamental engineering data to support development of potential corrective measures.

Groundwater Monitoring Wells Installation Program. Seven shallow (screened across the water table), four intermediate (screened approximately 45 to 55 feet bls) and four Hawthorn Group (screened approximately 70 to 80 feet bls) monitoring wells will be installed during the RFI at locations shown on Figure 3-13. As many as five additional shallow monitoring wells will be installed at locations to be determined in the field pending review of the geophysical survey and groundwater field screening results. The locations of the additional monitoring wells will be determined after completion of the groundwater field screening program and review of the analytical data. Proposed locations will be presented during a meeting or through a letter report with maps and supporting documentation. The Navy, USEPA, and FDEP will approve the proposed locations for these monitoring wells.

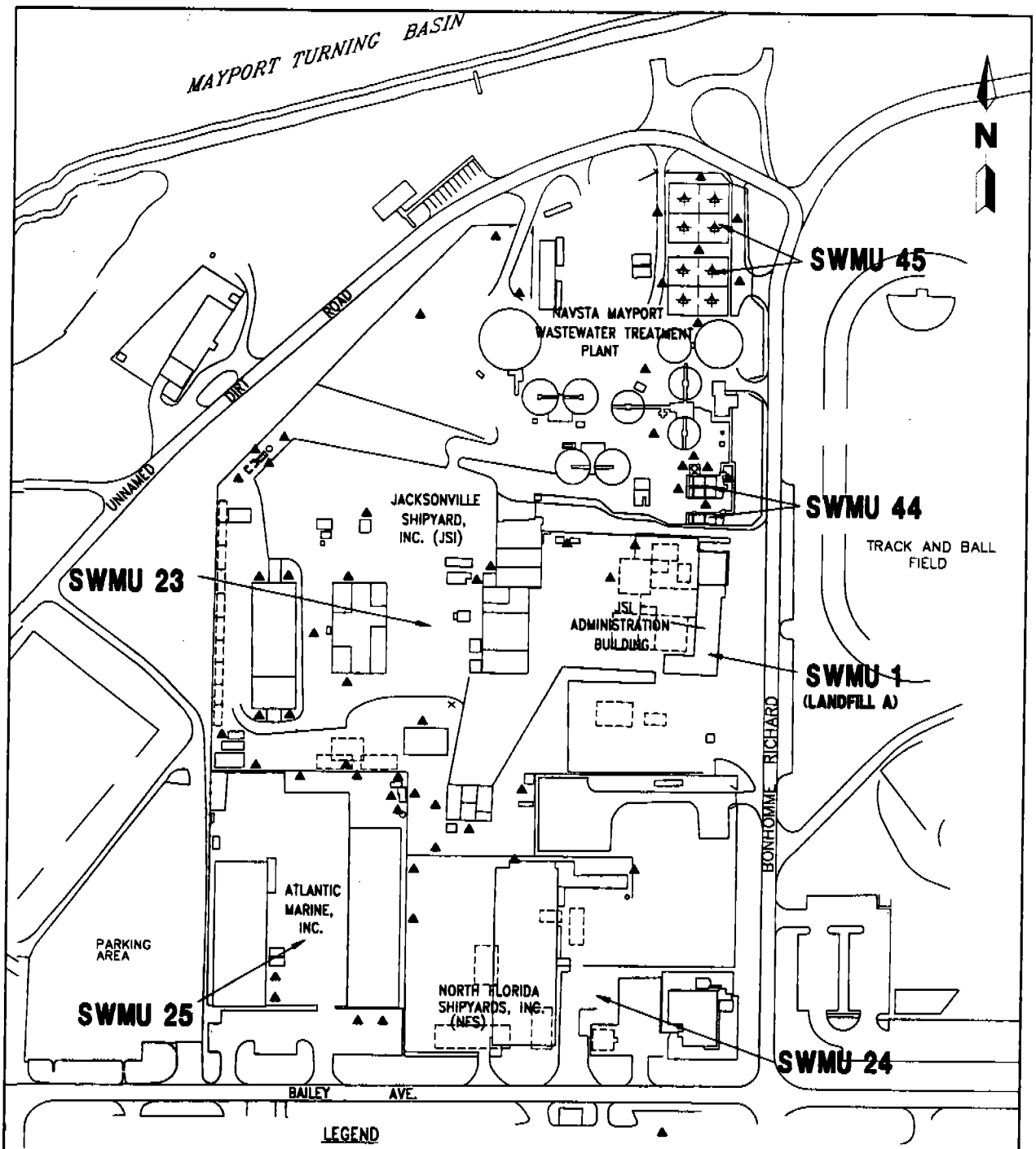

FIGURE 3-12
SWMUs 1, 23, 24, 25, 44, and 45, PROPOSED SURFACE SOIL AND COMPOSITE SURFACE AND SUBSURFACE SOIL SAMPLE LOCATIONS

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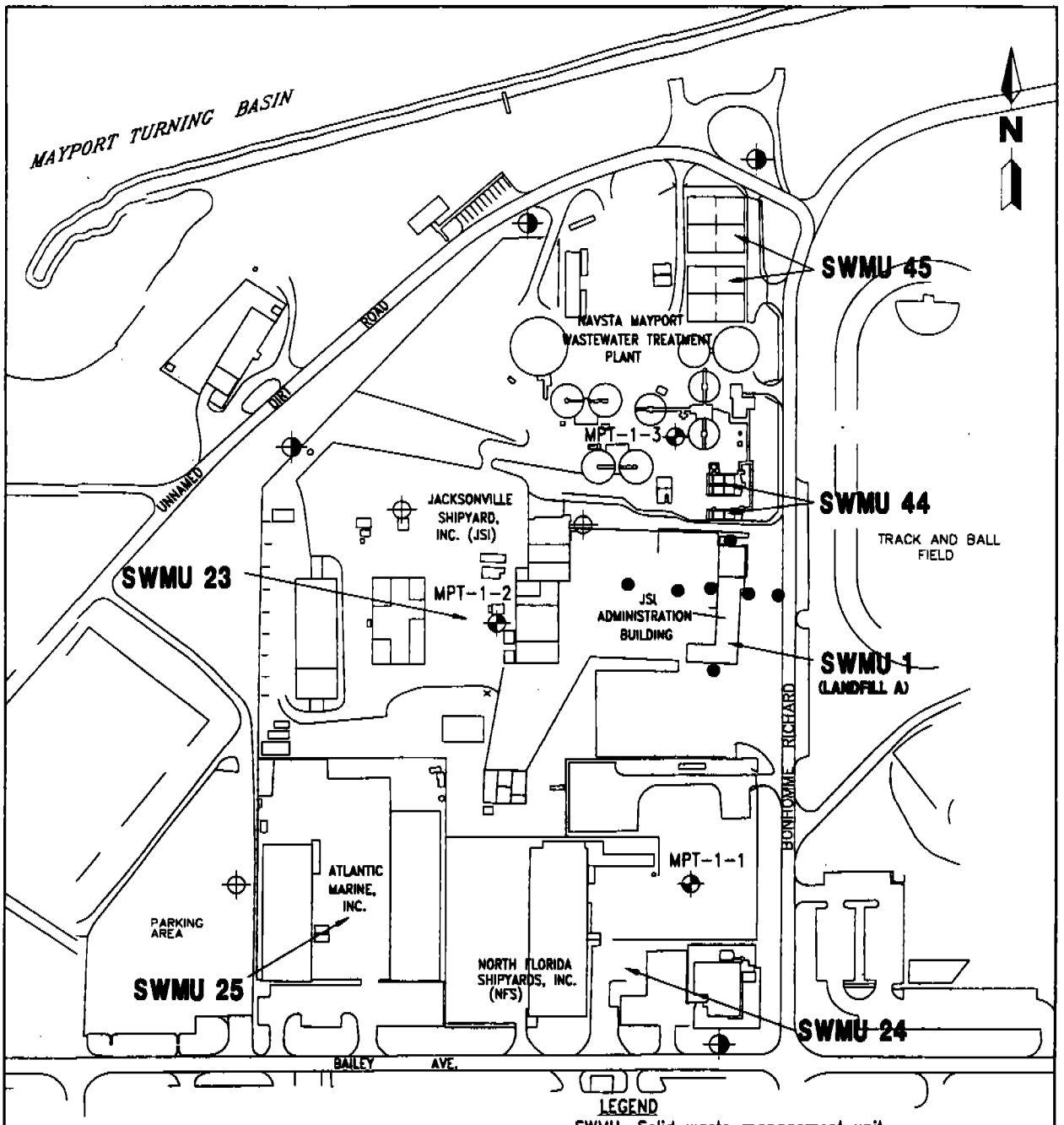

FIGURE 3-13
SWMUs 1, 23, 24, 25, 44, AND 45, EXISTING AND PROPOSED MONITORING WELL LOCATIONS

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Monitoring wells installed in a cluster will consist of a shallow, intermediate, and Hawthorn Group monitoring well (Figure 3-13). Typical construction diagrams for shallow, intermediate, and Hawthorn Group monitoring wells are provided in Figures 3-14, 3-15, and 3-16, respectively. The Hawthorn Group well will be the first well drilled and installed at a cluster. If a confining layer of sufficient thickness is encountered, the Hawthorn well(s) will be constructed as a double-cased well with the outer casing penetrating into the confining layer. The double casing is not illustrated on Figure 3-16.

Continuous split-spoon samples will be collected from the borehole of each Hawthorn Group monitoring well. The continuous sampling will provide lithologic control for the area in the vicinity of SWMUs 1, 23, 24, 25, 44, and 45 and will be used to identify low permeability zones (confining layers) within the surficial aquifer.

Previous hydrogeologic investigations (Causey and Phelps, 1978) have reported that the surficial aquifer in much of Duval County is composed of two zones, separated by deposits of lower permeability at depths ranging from 25 to 50 feet bls. This low permeability horizon should be observed during construction of the deep wells, if it exists at NAVSTA Mayport. The screened interval for both the intermediate and Hawthorn Group monitoring wells will be determined from the lithologic samples collected during the drilling of the borings for the Hawthorn Group monitoring wells.

Groundwater Sampling Program. Approximately 23 groundwater samples will be collected from each existing and newly installed monitoring well at SWMUs 1, 23, 24, 25, 44, and 45 (Figure 3-13). This groundwater sampling program includes a background well nest consisting of three wells (shallow, intermediate, and Hawthorn Group wells) installed near Lake Wonderwood. These background well locations do not appear on Figure 3-13 as Lake Wonderwood is approximately 1,600 feet southeast of these SWMUs.

The sampling procedure is a modification of previous sampling methods; however, it closely resembles a method proposed by USEPA (1994). Prior to groundwater sample collection, the monitoring well will be purged using a peristaltic pump to remove stagnant water without causing the resuspension of silts and clays. Turbidity, temperature, pH, and conductivity will be measured during purging to ensure good conductance between the well and the surrounding matrix. The monitoring well will be purged until temperature, conductivity, and pH have stabilized and a minimum of three well volumes of water have been removed. Purging will continue until the turbidity is below 5 nephelometric turbidity units (NTUs) or until the field operation leader believes further purging will not significantly decrease the turbidity (this decision will only be made after several hours of purging). A filtered and non-filtered sample will be collected at each well that has turbidity greater than 5 NTU.

Except for volatile organic compounds (VOCs), all groundwater samples will be collected using a peristaltic pump and disposable Teflon™ tubing. The samples will be collected before the material comes in contact with the pump. VOCs will be collected last. The sampler will try to prevent agitation of the water in the monitoring well by slowly lowering an open-bottom type bailer into the water. The bailer contents will be carefully transferred to a VOC vial for shipment to the laboratory.

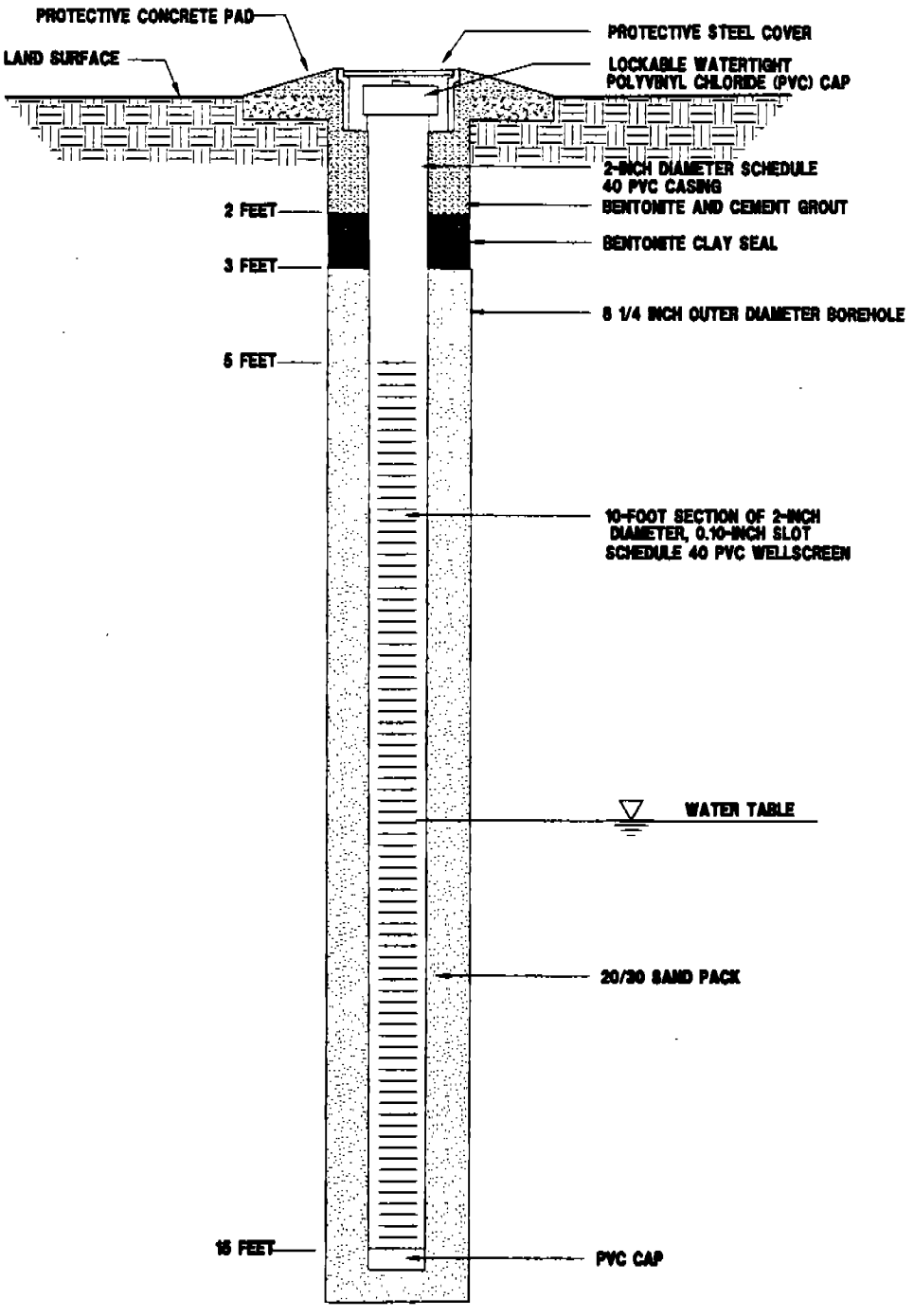

FIGURE 3-14
TYPICAL MONITORING WELL CONSTRUCTION DIAGRAM, SHALLOW ZONE, SURFICIAL AQUIFER

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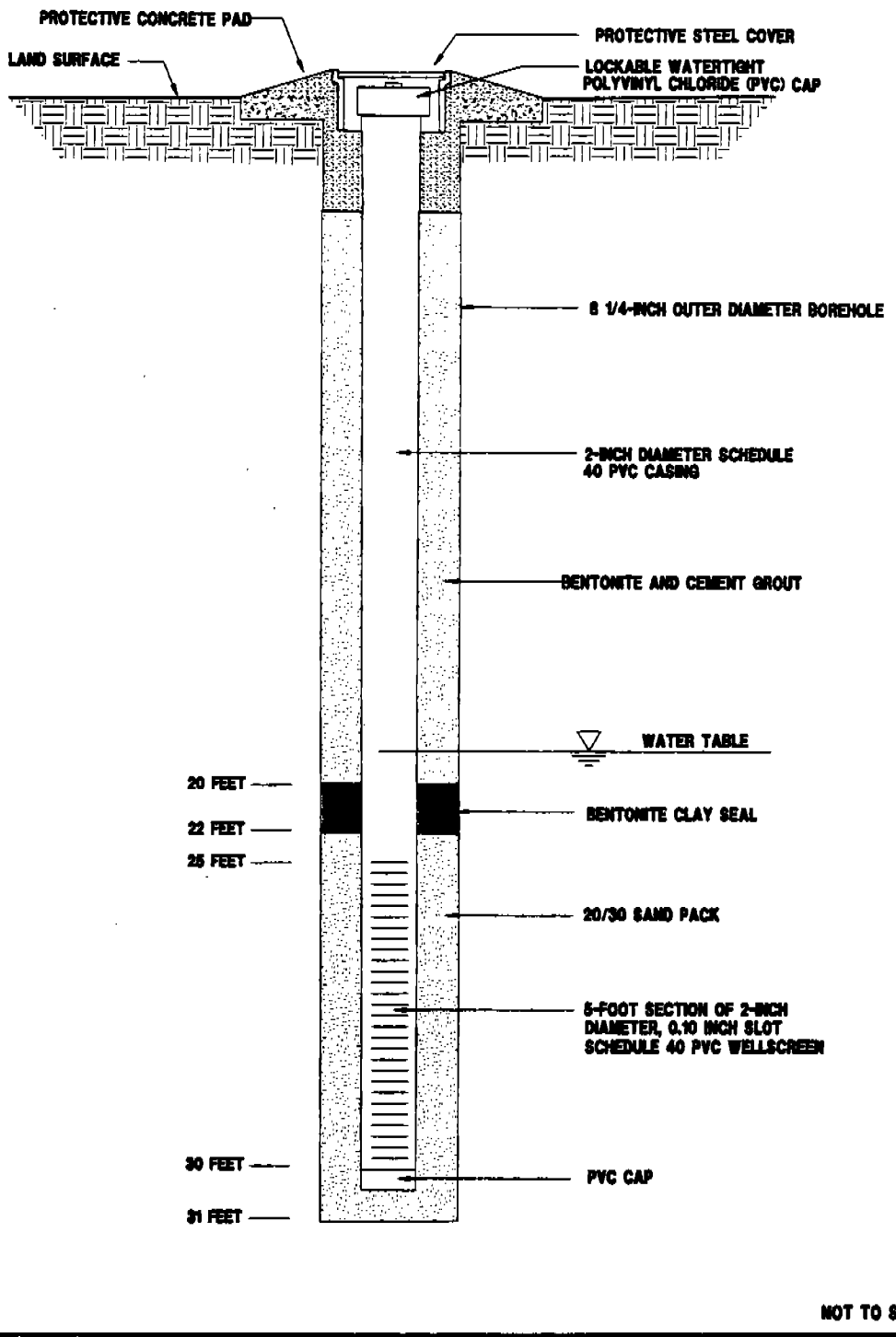

FIGURE 3-15
TYPICAL MONITORING WELL CONSTRUCTION DIAGRAM, INTERMEDIATE ZONE, SURFICIAL AQUIFER

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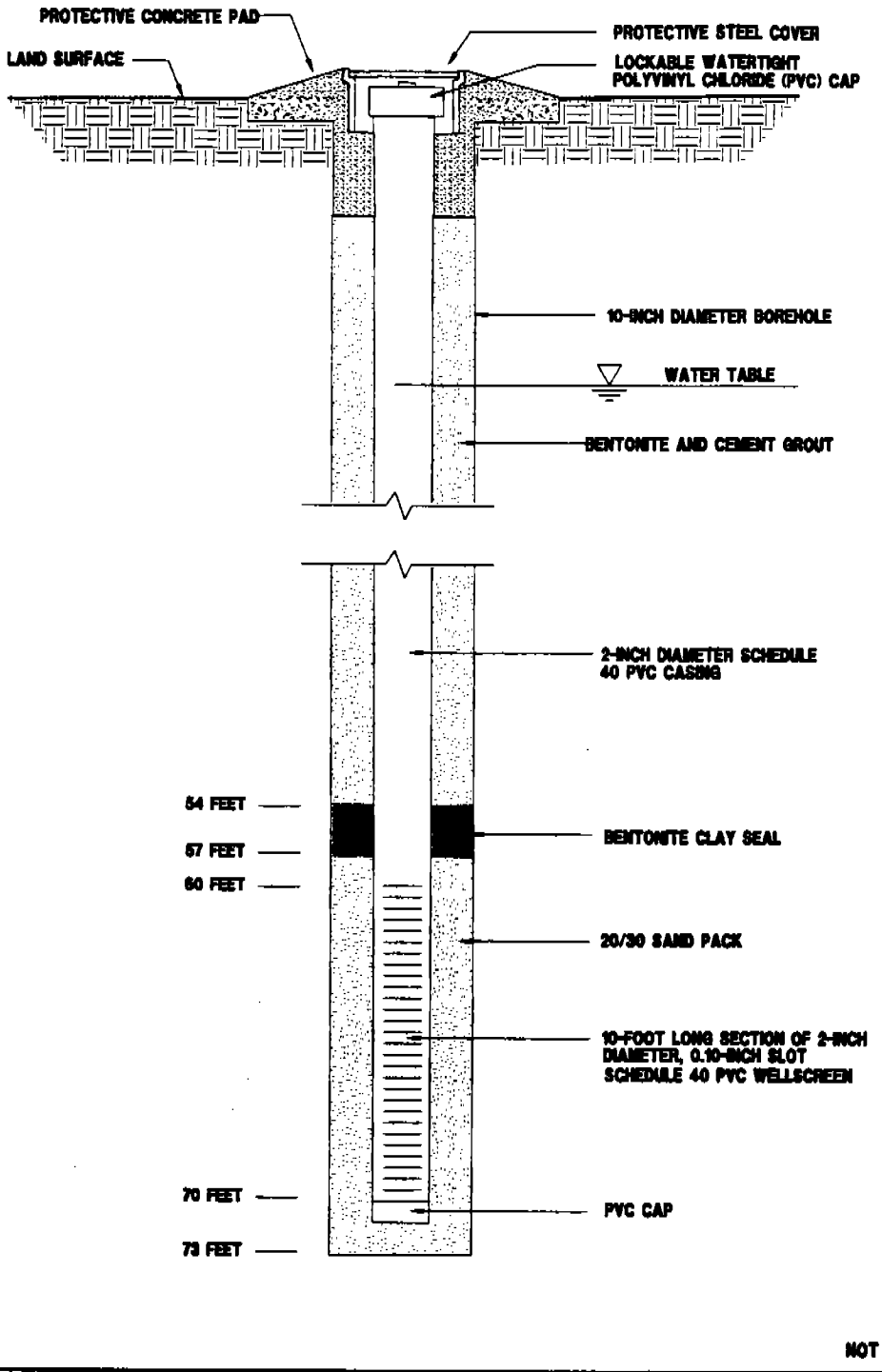

FIGURE 3-16
TYPICAL MONITORING WELL CONSTRUCTION DIAGRAM, DEEP ZONE, SURFICIAL AQUIFER, OR HAWTHORN FORMATION

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U.S. NAVAL STATION MAYPORT, FLORIDA

Environmental Sample Laboratory Analyses. As previously described, groundwater field screening samples (NEESA Level E, USEPA Level II DQO) will be analyzed either in the field using a portable GC or submitted to a laboratory for rapid turnaround of the analyses using USEPA Methods 8010 and 8020. The other surface and subsurface soil and groundwater samples collected at SWMUs 1, 23, 24, 25, 44, and 45 will be analyzed for target analytes selected from both the Groundwater Monitoring List contained in 40 CFR 264, Appendix IX, and USEPA's Contract Laboratory Program target compound list and target analyte list. These target analytes are described in Chapter 4.0, Analytical Program. The DQO for these samples will be NEESA Level C for aqueous and non-aqueous matrices for VOCs, semivolatile organic compounds (SVOCs), and pesticides and PCBs. The DQO for aqueous inorganics will be NEESA Level D and non-aqueous inorganics will be NEESA Level C. Descriptions of the analytical methods and lists of parameters included in the RCRA Appendix IX groundwater monitoring list are described in Section 4.0, Analytical Program.

Field quality assurance and quality control (QA/QC) samples also will be collected during sampling activities at SWMUs 1, 23, 24, 25, 44, and 45 and will be analyzed for the same parameters as the corresponding environmental samples. QA/QC requirements are presented in detail in the NAVSTA Mayport RFI workplan, Appendix A, Volume II (ABB-ES, 1991).

3.2 **SWMUs 14 and 18**. SWMU 14, the Mercury/Oil Waste Spill Area, and SWMU 18, the FTC, share a similar hydrogeologic setting and have similar contaminants. The two SWMUs have been grouped to facilitate a comprehensive approach to the investigation and the collection of environmental samples at locations where potential contaminants may emanate from multiple sources with overlapping contaminant plumes. Potential contaminants from these SWMUs include petroleum fuels and oils and metals. Figure 3-17 illustrates the locations of SWMUs 14 and 18 and areas associated with the FTC.

3.2.1 Site Descriptions The following section presents a description of SWMU 14, the Mercury/Oily Waste Spill Area and SWMU 18, FTC Diesel Generator Sump.

SWMU 14, the Mercury/Oily Waste Spill Area. SWMU 14, the Mercury/Oily Waste Spill Area is located at the FTC Fire-fighting Training (FFT) Center in the northeast part of NAVSTA Mayport adjacent to the mouth of the St. Johns River (Figures 1-2 and 3-17). Associated with SWMU 14 at the FFT Center are drains that connect to an oil-water separator (one of the SWMU 54 oil-water separators), a stormwater collection system, a petroleum storage area, and an area reportedly used for storage of mercuric nitrate (Figure 3-17). (See photographs in Appendix A.) At the FFT Center area, flammable liquids are used to create the training fires and a combination of water and foam are used to suppress the fires. The fire-fighting solution at one time contained aqueous film forming foam (AFFF) as a fire extinguishing material, but according to the RFA report, this practice had ceased by the mid 1980's (A.T. Kearney, Inc., 1989). Currently, the flammable fuels used as ignition sources at the FFT Center consist of diesel fuel (marine grade) and small amounts of gasoline. The RFA report indicated that in the past, waste fuels and oil were collected from sources around the station and some may have contained contaminants in addition to petroleum constituents (A.T. Kearney, Inc., 1989).

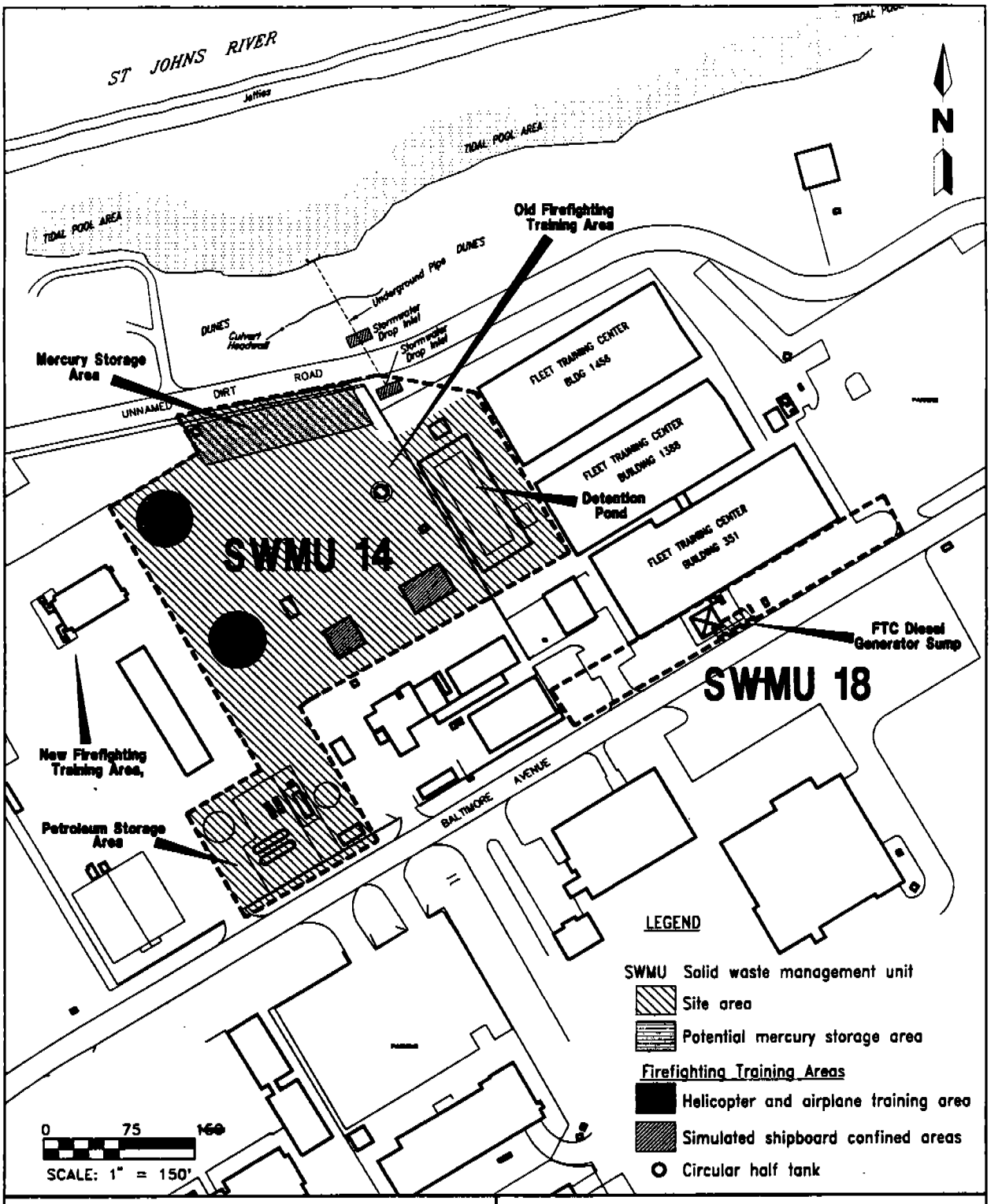

FIGURE 3-17
SWMUs 14 AND 18,
POTENTIAL SOURCES OF CONTAMINATION

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RCRA FACILITY INVESTIGATION
WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION
MAYPORT, FLORIDA

Construction of the FFT Center began in approximately 1964 and has undergone several modifications in later years. In 1987, construction began on a new FFT facility adjacent to the western boundary of the original concrete apron (Figure 3-17). The new FFT facility is not included in this RFI.

The following paragraphs describe the fire-fighting training area and associated drainage systems and the modifications made since the fire-fighting training area was constructed in 1964.

In approximately 1964, the FFT area contained four practice areas: two chambers to simulate confined areas on a ship, Buildings 361 and 355, and two circular shaped open tanks, tanks 356 and 357 (Figure 3-18). Each of these practice areas had a drain that flowed into the same oil-water separator. In addition, located throughout the FFT area concrete apron were surface drains that were used to collect stormwater runoff and fugitive fire-fighting waste liquids. Effluent from the oil-water separator and other stormwater collection drains went into a drainage culvert located northeast of the FFT concrete apron. The stormwater culvert discharges to the St. Johns River approximately 150 feet to the north, in an area that is currently behind the jetties that line the entrance to the St. Johns River.

In early 1970, the FFT concrete apron was expanded to the north and west, creating a total area of approximately 50,000 square feet (Figure 3-19). Two new practice areas were created and contained mock-ups of a helicopter (Area 492) and an airplane (Area 364). The new practice areas had their own drain that connected to the existing oil-water separator. The helicopter and plane mock-ups were surrounded by a 2-inch high asphalt berm (curb) to contain fuel and fire-fighting waste.

In 1978 the oil-water separator, located in the center of the FFT concrete apron (Figure 3-18), was removed and a new oil-water separator (estimated holding capacity of 10,000 gallons), wet well, and an unlined detention pond were constructed east of the FFT concrete apron (Figure 3-19). The training areas located on the FFT concrete apron and stormwater runoff both drained by gravity into the new oil-water separator. The unlined detention pond was used to contain fire-fighting waste liquid and stormwater runoff when the oil-water separator was full.

Floating free-phase oil was recovered by the new oil-water separator by allowing it to flow through an overflow pipe into an adjacent underground concrete container. The concrete container is estimated to have a capacity of 3,000 to 4,000 gallons. Effluent from the oil-water separator was piped to the WWTP.

Anecdotal evidence from NAVSTA Mayport FFT facility personnel suggests that during the mid 1970's to early 1980's, the piping from the oil-water separator to the WWTP would occasionally become backed up. When this condition occurred, the manhole located southwest of FTC Building 351 would overflow, which allowed wastewater to flow into an open stormwater drainage ditch located on the northern side of Baltimore Avenue. This drainage ditch flowed towards the east around FTC Building 351, then into an open stormwater drainage system located northeast of the FFT concrete apron.

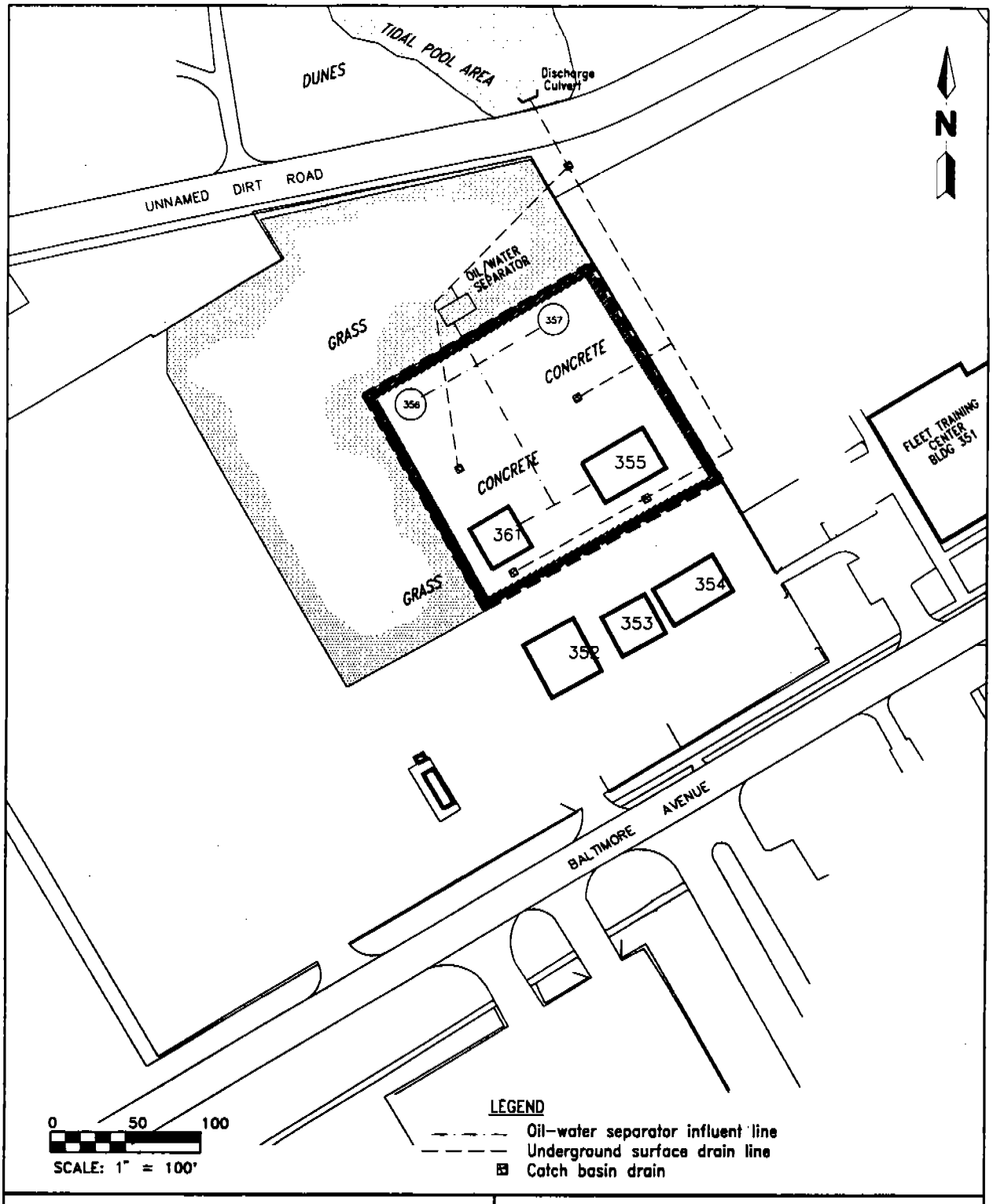

FIGURE 3-16
FIREFIGHTING TRAINING AREA AND DRAINAGE SYSTEM IN 1964

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U.S. NAVAL STATION MAYPORT, FLORIDA

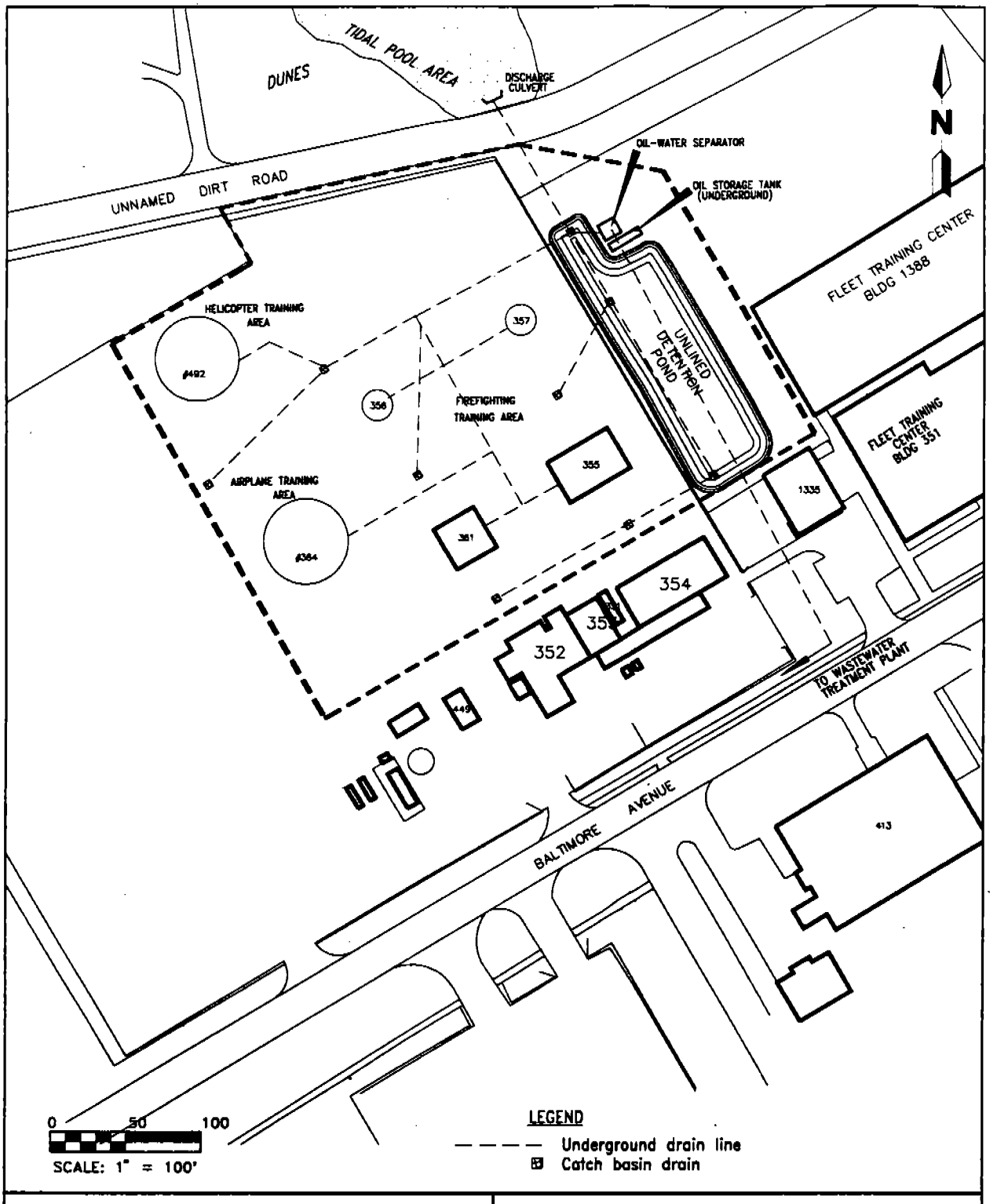

FIGURE 3-19
FIREFIGHTING TRAINING AREA AND DRAINAGE SYSTEM IN 1977

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RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

In 1987 the FFT waste liquid system was modified by the addition of an oil skimmer and removal of the 3,000- to 4,000-gallon capacity concrete oil containment tank. The unlined detention pond was also redesigned to make the basin shorter and wider and constructed with a concrete liner (Figure 3-20). The oil-water separator became an FFT waste liquid holding tank until the existing pumps could transfer the FFT waste liquid to the WWTP.

Since 1987, liquid wastes have been processed in the following manner. Liquid waste is stored either at the FFT oil-water separator or the concrete-lined detention pond and is transferred to Clarifiers 1, 2, and 3 (SWMU 45) at the WWTP. The waste is either transferred directly to OWTP (Group II, SWMU 9) or is held at Clarifiers 1, 2, and 3 until the OWTP can process the waste. After treatment at the OWTP, effluent is pumped back to the WWTP for final treatment before being discharged into the St. Johns River. The WWTP is regulated under National Pollution Discharge Elimination System (NPDES) permit number FL0000922.

The FTC petroleum storage area includes an underground 550-gallon capacity, fiberglass tank for storage of gasoline and a 10,000-gallon capacity, aboveground tank for the storage of diesel fuel. In approximately 1986, an underground 2,000-gallon capacity tank and an unknown size underground fuel oil tank were removed. No documents have been found describing the condition of these tanks when they were removed or whether environmental samples were collected and analyzed.

The RFA report identified an area located in the northern part of the FFT area as having been used to store 55-gallon capacity drums of mercuric nitrate (Figure 3-17) (A.T. Kearney, Inc., 1989). The report also indicated that in the past, four of the drums were rusted and possibly leaked mercuric nitrate to the environment. The rusted drums were indicated in the report to have been removed in 1984. The report did not indicate the disposal method or location.

SWMU 18, the FTC Diesel Generator Sump. SWMU 18, FTC Diesel Generator Sump, is located on the southern side of FTC Building 351, to the east of a radar antenna tower (Figure 3-17). (See photographs in Appendix A.) The FTC Diesel Generator Sump is a concrete containment structure that contains the FTC diesel power electrical generator. The FFT Diesel Generator Sump is approximately 5 feet wide and 10 feet long. Each side of the sump has a berm (curb) approximately 6 inches high. The diesel electric generator is contractor operated and maintained and has been at this location since approximately 1982 (A.T. Kearney, Inc., 1989). A stormwater drain is located adjacent to the FTC Diesel Generator Sump.

The purpose of the sump is to capture oil and diesel fuel that may leak from the diesel electric generator. A pipe with a manually operated valve protrudes out the south side of the 6-inch high concrete containment curb of the FTC Diesel Generator Sump, approximately 2 inches above the base. The purpose of the pipe and manual valve is to drain rain water that accumulates in the sump. However, based on the stained and distressed vegetation near a stormwater drain adjacent to the FTC Diesel Generator Sump, some oil and fuel may have been discharged onto the ground. The discharge occurs adjacent to the stormwater drain located approximately 4 feet from the FTC Diesel Generator Sump. Stained soils also were observed between the discharge pipe and the open stormwater ditch during the VSI in 1989 (A.T. Kearney, Inc., 1989).

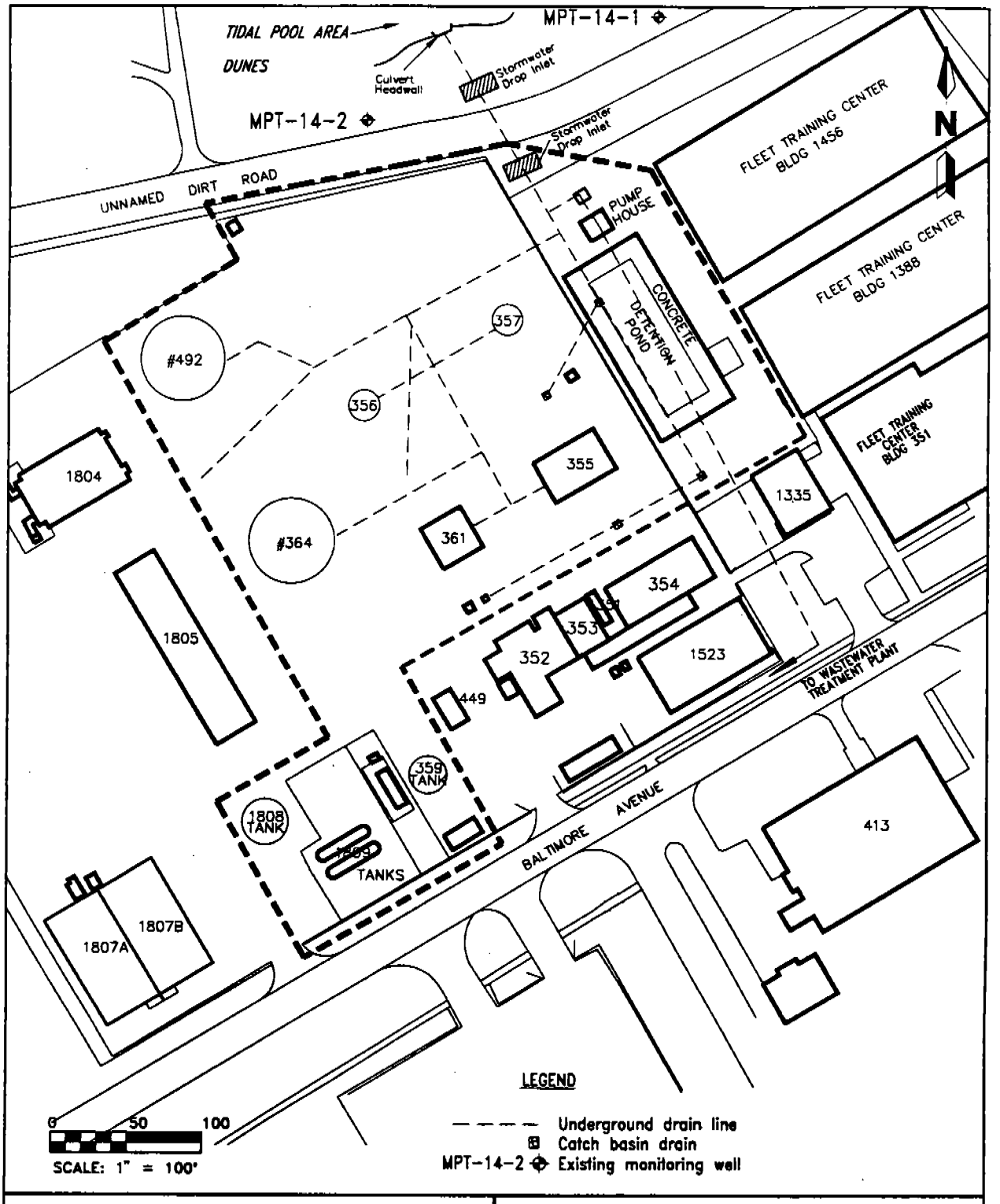

FIGURE 3-20
FIREFIGHTING TRAINING AREA AND DRAINAGE SYSTEM IN 1994

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RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

The stormwater drain flows to the drainage ditch on the northern side of Baltimore Avenue. This is the same drainage ditch that the FFT waste liquids would enter when the man-hole overflowed. Because both of the wastes are petroleum related, SWMUs 14 and 18 will be investigated together.

3.2.2 Summary of Previous Investigations at SWMUs 14 and 18 Environmental samples for chemical analyses have not been collected from SWMU 18, the FTC Diesel Generator Sump. An investigation was conducted at SWMU 14 during the ESI that included the following: installation of two groundwater monitoring wells (MPT-14-1 and MPT-14-2, Figure 3-20), collection of one soil sample from each boring, and collection of a groundwater sample from each monitoring well. The soil sample was collected from the unsaturated zone above the water table and the monitoring wells were screened across the water table (E.C. Jordan, 1988).

The analytical results from the soil samples show that VOCs, SVOCs, pesticides, and PCBs were detected. Leachate from the soil samples was analyzed using the extraction procedure toxicity test (EP Tox), and no metals were detected in the leachate (E.C. Jordan, 1988).

The analytical results of the groundwater samples indicate that mercury (total unfiltered) was detected at a concentration of 1.8 $\mu g/\ell$ in the sample from monitoring well MPT-14-2. VOCs, SVOCs, pesticides, and PCBs were not detected in the groundwater samples (E.C. Jordan, 1988).

Because only two monitoring wells were installed, the direction of groundwater flow for the shallow aquifer in the vicinity of SWMU 14 was not determined, but was estimated to be toward the north where it would discharge to the St. Johns River. Sediments at the location of the two borings were found to consist of fine- to medium-grained sands with some shells (E.C. Jordan, 1988).

3.2.3 Rationale for Sampling Activities at SWMUs 14 and 18 RFA SWMU 18, the FTC Diesel Generator Sump, is located adjacent to SWMU 14, Mercury/Oil Waste Spill Area (Figure 1-2). These two SWMUs share similar topographic and hydrogeologic settings and similar petroleum-related contamination. Based on the historical information, the most probable types of contaminants at SWMU 14 are mercury and petroleum products. Only petroleum products are expected from SWMU 18. Waste oils at SWMU 14 also may have contained solvents (A.T. Kearney, Inc., 1989).

Proposed field activities at SWMUs 14 and 18 are designed to characterize the nature and extent of contamination. The field activities are designed as an iterative process beginning with a field screening program to assess whether petroleum-related or solvent contamination is present and if present, delineate that contamination. Based on the results of the field screening program, confirmatory samples (soil, sediment, and groundwater) will be collected to assess contaminant fate and transport, evaluate human health and ecological risk, and provide fundamental engineering properties data to support development of potential corrective measures. Table 3-4 provides a summary of the number of samples to be collected by media and Table 3-5 provides a summary of samples by analytical method.

Groundwater Field Screening Program. A groundwater field screening program is proposed to collect groundwater samples in areas that store petroleum fuels and/or solvents at SWMU 14. The screening program will be used to assist in determining the location of groundwater monitoring wells. A minimum of 20 soil

borings or direct push technology soundings are proposed to collect groundwater field screening samples (Figure 3-21). Approximately 15 additional samples are proposed to delineate contamination discovered during the groundwater field screening program. The locations of the 15 additional groundwater field screening samples will be identified after reviewing analytical results of the initial sampling locations.

Analyses of groundwater field screening samples will be performed using a field GC with 10 percent laboratory confirmation by USEPA Methods 8010, 8020, and 8100. The DQO for the groundwater field screening samples will be NEESA Level E (USEPA DQO level 2). This DQO was selected because the purpose of this screening program is to assist in locating monitoring wells from which confirmatory groundwater samples will be collected.

Surface and Subsurface Soil Sampling. Twenty-nine surface soil samples (Figure 3-21) are proposed at or around SWMU 14 to assess the extent of contamination. Surface soil samples will be collected from the land surface to a depth of 1 foot bls. Where concrete or asphalt pavement occurs, the surface soil sample will consist of a sample collected from a 1-foot interval beneath the pavement or asphalt. The following is a description of the rationale and location of the surface soil samples.

> Six surface soil samples will be collected around the petroleum storage area to assess whether spills have occurred during the handling and storage of petroleum fuels.
>
> Four surface soil samples will be collected from the grassy borders around the FFT apron detention pond. These samples will assess the potential for the detention pond overflowing and spreading contaminants into the adjacent soil.
>
> Four surface soil samples will be collected from grassy areas that border the northern part of the FFT concrete apron. These samples will be used to assess the potential for surface water runoff to have impacted soil adjacent to the FFT concrete apron.
>
> Three surface soil samples will be collected from under the concrete apron at the area thought to be the mercury storage area, based on the A.T. Kearney description (A.T. Kearney, Inc., 1989). Holes will be cored or drilled through the concrete at three locations where joints separate individual concrete pads. These three samples will be used to assess the potential for mercury nitrate and other contaminants to have been released to the environment by migration through the joints in the concrete pads.

Eight surface soil sample locations to be determined in the field will be based on results from the groundwater field screening and monitoring well installation programs. Surface soil sample locations will be biased to worst case locations (e.g., stained areas, low areas where ponding occurs, etc.).

Fifteen surface and 30 subsurface soil samples will be collected during drilling activities for monitoring well installation. Continuous split-spoon samples will be collected during the installation of each monitoring well. An OVA will be used to detect VOCs that may be present in the soil retrieved by the split-spoon

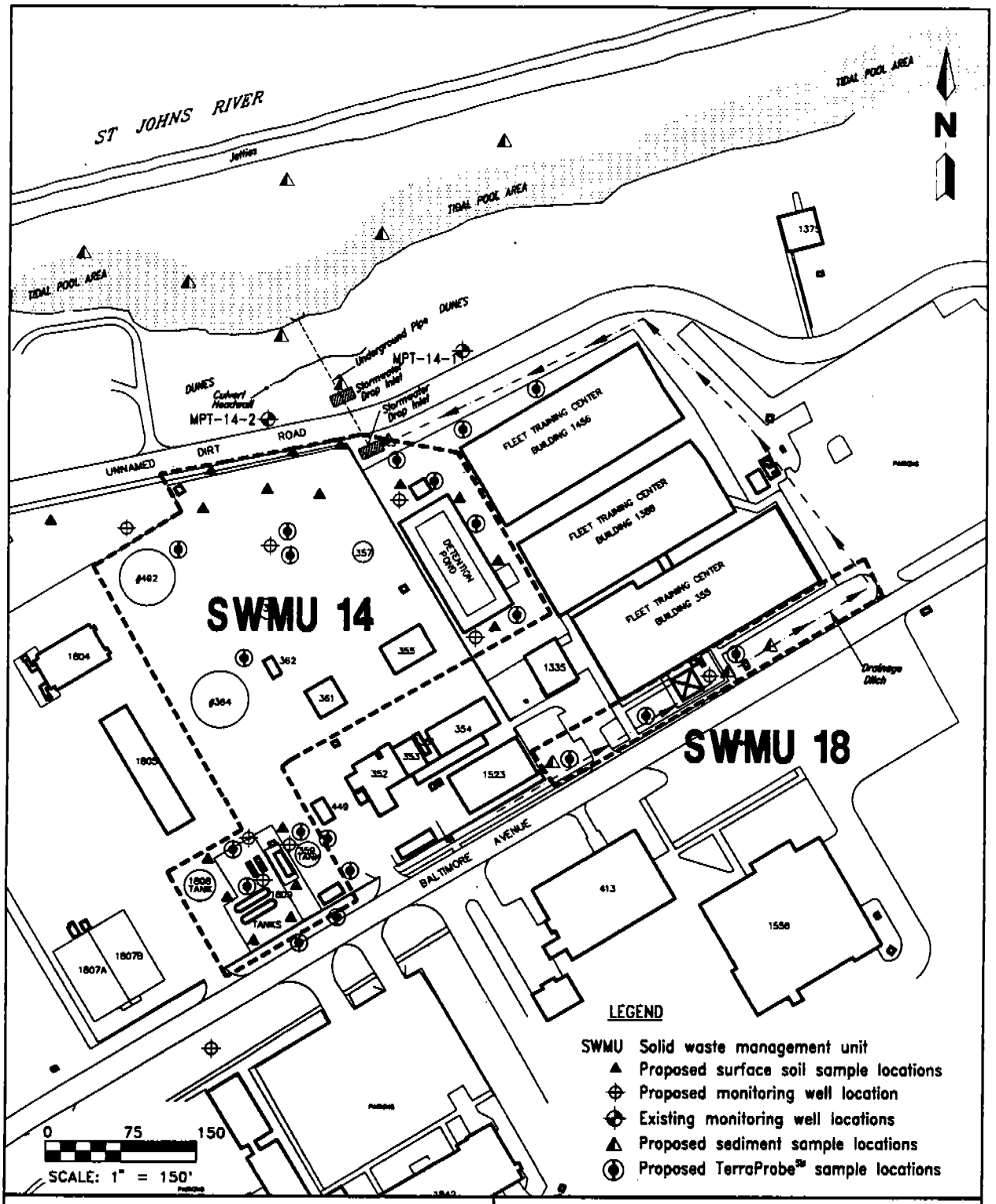

FIGURE 3-21
SWMU 14 AND 18
PROPOSED TERRAPROBE℠, SURFACE SOIL, SUBSURFACE SOIL, SEDIMENT, AND GROUNDWATER SAMPLE LOCATIONS

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RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

sampler. Soil samples will be collected at the following intervals: land surface to a depth of 1 foot bls, a 1-foot interval immediately above the water table, and in areas where the water table is greater than 8 feet, a subsurface soil sample will be collected from a 1-foot interval that has the highest OVA measurement based upon field screening or as a default approximately halfway between the land surface and the water table.

Four subsurface soil samples will also be collected during drilling of the monitoring wells and analyzed for general physical and chemical properties. The soil samples will be collected during the drilling program for the monitoring wells to assess the variability soil properties in the vicinity of SWMUs 14 and 18. These physical and chemical properties will include bulk density, cation exchange capacity, organic content, soil pH, particle-size distribution, moisture content, and infiltration (at each bore-hole location). Properties of porosity and soil sorptive capacity will be derived from these basic physical and chemical properties. These parameters will be used to assess contaminant fate and transport and human health and ecological risk, and will provide fundamental engineering properties data to support development of potential corrective measures.

Surface Water and Sediment Sampling Program. Stormwater discharge from SWMU 14 could potentially contain fugitive fire-fighting liquid waste contaminants. Seven sediment samples will be collected between the stormwater culvert discharge and the St. Johns River (Figure 3-21). The sediment samples will be collected at low tide; however, if water is pooled at the time of sample collection, a surface water sample will also be collected.

Three sediment samples will be collected to assess the potential for contaminants to have been released from SWMU 14 at the location of the manhole into the FTC stormwater ditch. These surface soil or sediment samples will be collected from the stormwater drainage ditch in front of FTC Building 351. The drainage ditches are normally dry; however, if the ditches contain water at the time of sampling, surface water samples will be collected.

Monitoring Well Installation Program. Nine monitoring wells (Figure 3-21) will be installed at potential sources of contamination at SWMU 14 to assess the horizontal and vertical extent of contamination. Six additional monitoring wells will be located based on the results of the groundwater field screening program. The locations of the additional monitoring wells will be determined after completion of the groundwater field screening program and review of the analytical data. The Navy, USEPA, and FDEP will be consulted on the locations for these monitoring wells. Proposed locations will be conveyed through monitoring well location maps and supporting documentation.

The nine monitoring wells at sources of potential contamination will be installed to an estimated maximum depth of 20 feet bls (see Figure 3-14 for the typical construction diagram of a shallow monitoring well). The monitoring wells will be screened across the water table. The following paragraphs describe the locations of the nine monitoring wells.

> Four monitoring wells will be installed around the petroleum storage area, three monitoring wells located in a presumed hydraulic downgradient direction and one well in a presumed hydraulic upgradient direction of the site.

One monitoring well will be installed along the grassy area next to SWMU 18, FTC Diesel Generator Sump. Only one monitoring well is proposed at SWMU 18 to assess whether releases have caused an impact to groundwater.

Two monitoring wells will be located on the northern and southern ends of the concrete lined detention pond. The locations of the two monitoring wells should be within the boundary of the original unlined detention pond (Figure 3-21).

One monitoring well will be installed in the north central part of the FFT concrete apron near the area where an oil-water separator was formerly located from 1964 until the early 1970's.

One monitoring well will be installed in the grassy area northwest of the FFT concrete apron. This monitoring well will be used to assess the potential for contaminants to have washed off the apron and impact groundwater quality.

If an impact(s) is confirmed at these locations, then groundwater field screening will be implemented to assess the horizontal extent of contamination before the installation of additional monitoring wells.

Groundwater Sampling Program. Groundwater samples will be collected from each existing and newly installed monitoring well at SWMUs 14 and 18. The sampling procedure is a modification of previous sampling methods; however, it closely resembles a method proposed by USEPA (1994). Prior to groundwater sample collection, the monitoring well will be purged using a peristaltic pump to remove stagnant water without causing the resuspension of silts and clays. Turbidity, temperature, pH, and conductivity will be measured during purging to ensure good conductance between the well and the surrounding matrix. The monitoring well will be purged until temperature, conductivity, and pH have stabilized and a minimum of three well volumes of water have been removed. Purging will continue until the turbidity is below 5 nephelometric turbidity units (NTUs) or until the field operation leader believes further purging will not significantly decrease the turbidity (this decision will only be made after several hours of purging). A filtered and non-filtered sample will be collected at each well that has turbidity greater than 5 NTU.

Except for VOCs, all groundwater samples will be collected using a peristaltic pump and disposable Teflon™ tubing. The samples will be collected before the material comes in contact with the pump. VOCs will be collected last. The sampler will try to prevent agitation of the water into the monitoring well by slowly lowering an open-bottom type bailer into the water. The bailer contents will be carefully transferred to a VOC vial for shipment to the laboratory.

Environmental Sample Laboratory Analysis. As previously described, groundwater field screening samples (NEESA Level E, USEPA Level II DQO) will be analyzed either in the field using a portable GC or submitted to a laboratory for rapid turnaround of the analyses using USEPA Methods 8010 and 8020. The other surface and subsurface soil and groundwater samples collected at SWMUs 14 and 18 will be analyzed for target analytes selected from both the groundwater monitoring list contained in 40 CFR 264, Appendix IX, and USEPA's Contract Laboratory Program target compound list and target analyte list. These target analytes are

described in Chapter 4.0, Analytical Program. The DQO for these samples will be NEESA Level C for aqueous and non-aqueous matrices for VOCs, SVOC, pesticides, and PCBs. The DQO for aqueous inorganics will be NEESA Level D and NEESA Level C for non-aqueous inorganics. Descriptions of the analytical methods and lists of parameters included in the RCRA Appendix IX groundwater monitoring list are described in Chapter 4.0, Analytical Program.

Field QA/QC samples also will be collected during sampling activities at SWMUs 14 and 18 and will be analyzed for the same parameters as the environmental samples. QA/QC requirements are presented in detail in The NAVSTA Mayport RFI workplan, Appendix A, Volume II (ABB-ES, 1991).

3.3 SWMU 17 RFI SWMU 17, the Carbonaceous Fuel Boiler, is being assessed as a single unit because it is not located adjacent to any of the other RFI or RFA SWMUs.

3.3.1 Site Description of SWMU 17 SWMU 17, the Carbonaceous Fuel Boiler, is located south of the Mayport Basin about 350 feet west of the destroyer slip (Figure 1-2). The Carbonaceous Fuel Boiler is a domestic, solid waste incinerator that was fueled by waste oil augmented by diesel fuel. The incinerator produced steam for ships berthed at Mayport Turning Basin. The Carbonaceous Fuel Boiler consists of a building that houses tipping bins (temporary holding bins for domestic, solid waste), the incinerator, an asphalt parking lot, and four underground storage tanks that contain waste oil or diesel fuel.

Waste oil for the incinerator was collected from various locations on-station and from bilge water recovered at the OWTP (Group II SWMU 9) (A.T. Kearney, Inc., 1989). Waste oil at the Carbonaceous Fuel Boiler is stored in two 6,000-gallon capacity underground tanks, which are located on the western side of Building 1430. The 6,000-gallon capacity underground storage tanks are included in Group IV SWMU 51. (See photographs in Appendix A.) Also, two 550-gallon capacity underground storage tanks, which contain diesel fuel, are located on the western side of Building 1430 (Figure 3-22).

From 1979 to mid-1994, the Carbonaceous Fuel Boiler, located in Building 1430, was used to dispose of domestic solid waste from NAVSTA Mayport and the station's housing area. The incinerator was contractor operated 24 hours a day, and has a design capacity of 48 tons of burnable waste per day with a typical loading rate of 42 to 45 tons per day (A.T. Kearney, Inc., 1989). Materials in the temporary holding bins were usually incinerated within 24 hours. Boiler blowdown, tipping floor runoff, and quench water were discharged to the sanitary sewer system (A.T. Kearney, Inc., 1989).

Heat from the incinerator was used to generate steam for ships berthed at NAVSTA Mayport. The boiler has an operating pressure of 180 pounds per square inch. Air emissions from the Carbonaceous Fuel Boiler are permitted under FDEP Permit No. A019-17873 and air emissions monitoring has been conducted by the City of Jacksonville, Bio-Environmental Services Department (A.T. Kearney, Inc., 1989).

The boiler's air emission control system includes a continuous blowdown for quenching ash and a fly ash collector. Quenched ash (wet ash) was removed from the bottom of the incinerator and placed in dumpsters. Fly ash (dry ash) was

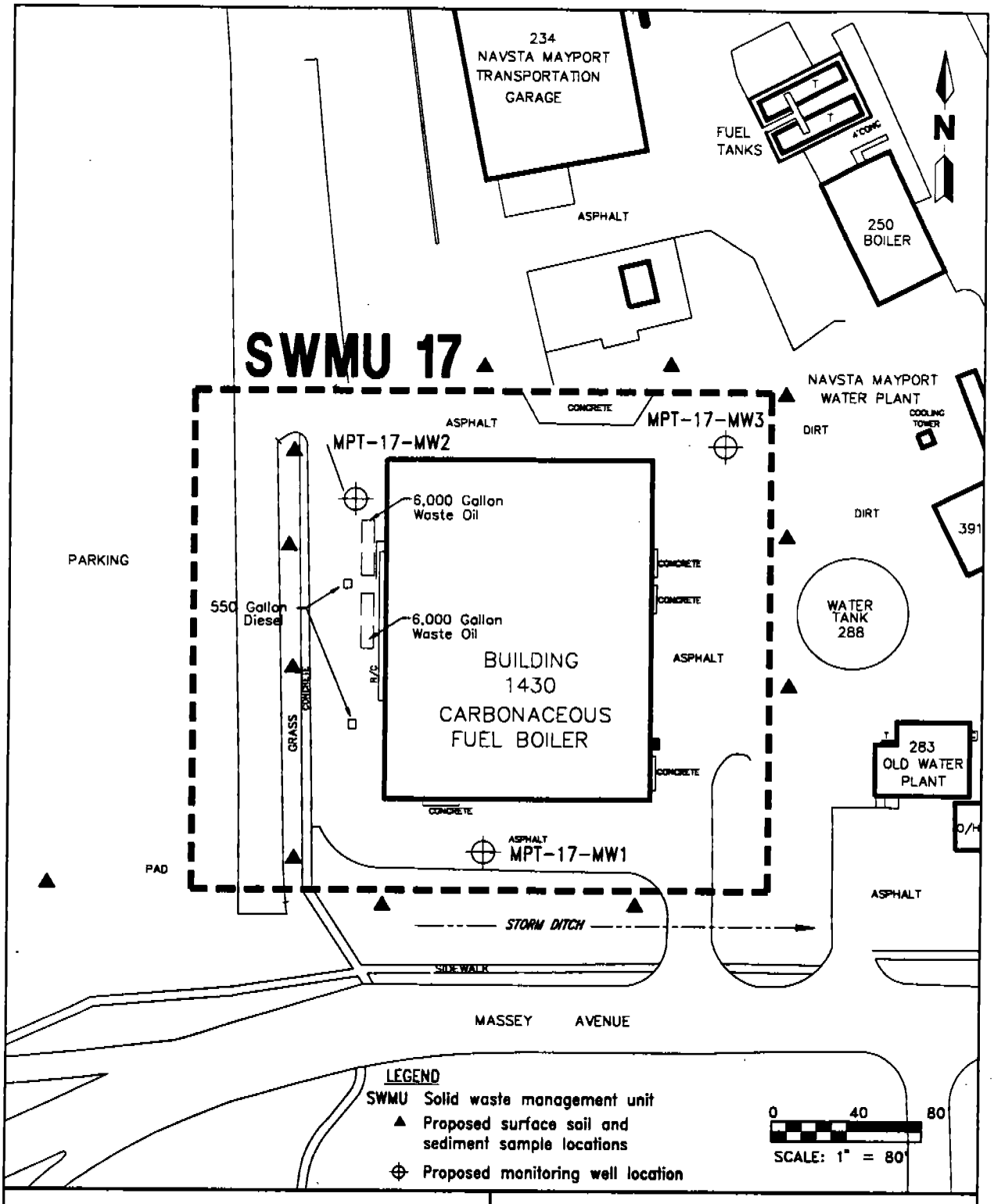

FIGURE 3-22
SITE MAP AND SURFACE SOIL SAMPLE LOCATIONS, SWMU 17, CARBONACEOUS FUEL BOILER

MAYPORT\SWMU14\WDW\11-10-94

RCRA FACILITY INVESTIGATION WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION MAYPORT, FLORIDA

collected by a multi-cyclone and disposed along with the wet ash. Approximately 6,260 cubic yards of wet ash and fly ash were generated yearly (A.T. Kearney, Inc., 1989). Ash materials were taken to the station's landfill(s) until early 1985 (A.T. Kearney, Inc., 1989), and subsequently to an off-station landfill.

Wet ash has been tested in the past and was not determined to exceed Federal regulatory criteria for hazardous waste using the EP Tox testing method (A.T. Kearney, Inc., 1989). However, the fly ash has been found to exceed Federal regulatory criteria for lead and cadmium using the EP Tox testing method (A.T. Kearney, Inc., 1989).

The RFA report identified the Carbonaceous Fuel Boiler as an SWMU because fly ash was being stored on the north side of the Carbonaceous Fuel Boiler building and a small amount of ash was noted to be piled on the asphalt near a roll-off container (A.T. Kearney, Inc., 1989). Wet ash and fly ash were typically stored in roll-off dumpsters. These dumpsters were staged on the eastern, northern, and western sides of Building 1430.

3.3.2 Summary of Previous Investigations at SWMU 17 No environmental assessment has been conducted at SWMU 17. A geotechnical investigation was conducted to evaluate subsurface conditions for design of the boiler building foundation. Subsurface materials identified at the location of the geotechnical soil borings indicate the presence of poorly graded sands with shell fragments.

3.3.3 Rationale for Sampling Activities at SWMU 17 A.T. Kearney identified fly ash as a potential contaminant at SWMU 17 because it exceeded toxicity characteristic limits and was observed to be uncontrolled on the north side of the Carbonaceous Fuel Boiler building. The assessment of SWMU 17 will consist of the collection of surface soil samples and installation of monitoring wells to assess whether contaminants have been released to the environment. Table 3-3 provides a summary of the number of samples to be collected by media and Table 3-5 provides a summary of samples by analytical method.

Surface and Subsurface Soil Sampling Program. Fifteen surface soil samples are proposed to assess whether contaminants have been released to the environment by fly ash at the Carbonaceous Fuel Boiler (Figure 3-22). Surface soil samples will be collected from the land surface to a depth of 1 foot bls. The following presents a description of each of the sampling locations.

> Four surface soil samples will be located on the eastern side of Building 1430, in the grassy area adjacent to the asphalt parking lot, and topographically downgradient of the loading dock entrances, where solid waste materials are stored in temporary holding bins.
>
> Four soil samples will be collected from the grassy area on the west side of building 1430. Wet ash (quenched ash) and fly ash were stored in roll-off bins that were parked in this area until the full bins could be hauled off for disposal (A.T. Kearney, Inc., 1989). If ash materials or contaminants were released from the storage bins, the material would flow topographically downgradient, into the grassy areas adjacent to the asphalt.
>
> Two surface soil samples will be collected from the grassy area between the southern side of Building 1430 and Massey Avenue. The

adjacent asphalt parking lot was not used for accumulation of wet ash or fly ash storage bins; therefore, these surface samples will serve as background locations to assess the influence from vehicles traversing nearby roads.

Two surface soil samples will be collected from the north side of Building 1430, in the transportation garage parking lot, and topographically downgradient of the area A.T. Kearney, Inc., described as the solid waste temporary holding bin storage.

Surface and subsurface soil samples will be collected during the installation of three shallow monitoring wells. Samples will be collected at the following intervals: land surface to a depth of 1 foot bls, a 1-foot interval immediately above the water table, and in areas where the water table is greater than 8 feet, a subsurface soil sample will be collected from a 1-foot interval that has the highest OVA measurement based upon field screening or as a default approximately halfway between the land surface and the water table.

A site-specific background surface soil sample will be collected from the park located to the east of SWMU 17. The park is an area of natural soil that has been minimally affected by industrial activities at NAVSTA Mayport. Dredge spoil is not known to have been placed at this location.

Groundwater Monitoring Well Installation Program. Three shallow (screened across the water table) monitoring wells will be installed during the RFI at locations shown on Figure 3-22. These wells will assess whether releases of contaminants have occurred from any of the four underground storage tanks or from the carbonaceous fuel burner's operations or handling of fly ash wastes.

Groundwater Sampling Program. Prior to collecting the groundwater samples, water-level measurements will be collected within a 4-hour period and used to produce a water surface isopleth map.

Three groundwater samples will be collected from the newly installed monitoring wells. The sampling procedure is a modification of previous sampling methods; however, it closely resembles a method proposed by USEPA (1994). Prior to groundwater sample collection, the monitoring well will be purged using a peristaltic pump to remove stagnant water without causing the resuspension of silts and clays. Turbidity, temperature, pH, and conductivity will be measured during purging to ensure good conductance between the well and the surrounding matrix. The monitoring well will be purged until temperature, conductivity, and pH have stabilized and a minimum of three well volumes of water have been removed. Purging will continue until the turbidity is below 5 NTUs or until the field operation leader believes further purging will not significantly decrease the turbidity (this decision will only be made after several hours of purging). A filtered and a non-filtered sample will be collected at each well that has turbidity greater than 5 NTU.

Except for VOCs, all groundwater samples will be collected using a peristaltic pump and disposable Teflon™ tubing. The samples will be collected before the material comes in contact with the pump. VOCs will be collected last. The sampler will try to prevent agitation of the water in the monitoring well by

slowly lowering an open-bottom type bailer into the water. The bailer contents will be carefully transferred to a VOC vial for shipment to the laboratory.

Environmental Sample Laboratory Analysis. The surface soil, subsurface soil, and groundwater samples collected at SWMU 17 will be analyzed for target analytes selected from both the Groundwater Monitoring List contained in 40 CFR 264, Appendix IX, and USEPA's Contract Laboratory Program target compound list and target analyte list. These target analytes are described in Chapter 4.0, Analytical Program. The DQO for the soil samples will be NEESA Level C. Descriptions of the analytical methods and lists of parameters included in the RCRA Appendix IX Groundwater Monitoring List are presented in Chapter 4.0, Analytical Program.

4.0 ANALYTICAL PROGRAM

The analytical program for the Group III RFI at NAVSTA Mayport will address analytes selected from both the 40 CFR 264, Appendix IX, groundwater monitoring list and the USEPA Contract Laboratory Program target compound list and target analyte list (Tables 4-1 through 4-4). Tables 4-1 through 4-4 provide a summary of target analytes in both lists, current target analytes, and target analytes that have been detected in previous investigations at NAVSTA Mayport. Gas chromatography and mass spectroscopy (GC/MS) methods will be used for analyses of environmental and QA/QC samples. Specifically, USEPA Method 8240 will be used to analyze for VOCs (Table 4-1) and USEPA Method 8270 will be used to analyze for SVOCs (Table 4-2). USEPA Method 8080 will be used to analyze for chlorinated pesticides and PCBs (Table 4-3). Tentatively identified compounds (TIC) will be determined in approximately 20 percent of the VOC and SVOC analyses. Organophosphorus pesticides (USEPA 8140) and chlorinated herbicides (USEPA Method 8150) are target analytes only at sites known to be used for pesticide storage, handling, and mixing. No such sites have been identified at Group III; therefore, analyses will not be conducted for organophosphorus pesticides, and chlorinated herbicides. Selected metals will be analyzed by inductively coupled plasma (ICP), graphite furnace atomic absorption (GFAA), or cold vapor atomic absorption (CVAA), as appropriate (e.g., USEPA Methods 6010, 7420, or 7470) (Table 4-4). USEPA Method 9010 will be used to analyze for cyanide.

DQOs for VOCs, SVOCs, pesticides, PCBs, and solid matrix inorganics will be NEESA Level C. DQOs for aqueous matrix inorganics will be NEESA Level D. The NEESA Level D DQO will be used to assess the analytical data for false positive or negative results.

The number of field and laboratory QA/QC samples to be collected will be in accordance with the generic Quality Assurance Program Plan (QAPP), Appendix A, Volume II, of the NAVSTA Mayport RFI Workplan (ABB-ES, 1991). Field and laboratory QA/QC samples will be analyzed by the same analytical methods as the associated environmental samples. The following presents a brief description of field QA/QC samples that will be collected.

- **Duplicates**. Duplicates of soil, waste, groundwater, surface water, and sediment samples will be submitted for analyses at a rate of 10 percent of the samples analyzed, or a minimum of 1 per event for each media sampled.

- **Trip Blanks**. A trip blank will be included with each shipment of samples scheduled for VOC analysis and will be analyzed with other VOC samples.

- **Equipment Rinsate Blanks**. A minimum of one equipment rinsate (sampler) blank per week per media will be collected from each piece of equipment used in the sampling event (bailers, sampling pumps, and/or tubing). If equipment is decontaminated in the field, then a minimum of two equipment rinsate blanks will be collected each day. One will be collected at the initiation of daily sampling activities and the other at the completion.

- **Field Blanks**. A field blank or source water blank will be collected at a rate of at least one blank per field event or every 10 days, whichever is greater. The source blank monitors water used by the field operations for daily operations.

Table 4-1
Gas Chromatograph amd Mass Spectrometer Volatiles
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Volatile Organic Compounds	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
Chloromethane		✓	✓	
Bromomethane		✓	✓	
Vinyl chloride	✓	✓	✓	
Chloroethane	✓	✓	✓	
Methylene chloride	✓	✓	✓	✓
Acetone	✓	✓	✓	✓
Carbon disulfide	✓	✓	✓	✓
Trichlorofluoromethane	✓		✓	✓
1,1-Dichloroethene	✓	✓	✓	
1,1-Dichloroethane	✓	✓	✓	✓
1,2-Dichloroethene (total)	✓	✓	✓	
Chloroform	✓	✓	✓	✓
1,2-Dichloroethane	✓	✓	✓	
2-Butanone	✓	✓	✓	✓
1,1,1-Trichloroethane	✓	✓	✓	
Carbon tetrachloride	✓	✓	✓	
Bromodichloromethane	✓	✓	✓	✓
1,2-Dichloropropane	✓	✓	✓	
cis-1,3-Dichloropropene	✓	✓	✓	
Trichloroethene	✓	✓	✓	✓
Benzene	✓	✓	✓	✓
Dibromochloromethane	✓	✓	✓	✓
1,1,2-Trichloroethane	✓	✓	✓	
trans-1,3-Dichloropropene	✓	✓	✓	
2-Chloroethylvinylether			✓	
Bromoform	✓	✓	✓	
2-Hexanone	✓	✓	✓	
Tetrachloroethene	✓	✓	✓	
1,1,2,2-Tetrachloroethane	✓	✓	✓	✓
Toluene	✓	✓	✓	✓
Chlorobenzene	✓	✓	✓	✓
Ethylbenzene	✓	✓	✓	✓
Styrene	✓	✓	✓	
Xylenes (total)				

See notes at end of table.

Table 4-1 (Continued)
Gas Chromatograph and Mass Spectrometer Volatiles
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Volatile Organic Compounds	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
4-Methyl-2-pentanone	✓	✓	✓	
1,3-Dichlorobenzene	✓		✓	
1,4-Dichlorobenzene	✓		✓	✓
1,2-Dichlorobenzene	✓		✓	
Acetonitrile	✓		✓	✓
Acrolein	✓		✓	✓
Acrylonitrile	✓		✓	
Chloroprene	✓		✓	
3-Chloropropene	✓		✓	
1,2-Dibromo-3-chloropropane	✓		✓	✓
1,2-Dibromoethane	✓		✓	
Dibromomethane	✓		✓	
1,4-Dioxane	✓		✓	
Propionitrile	✓		✓	
Ethyl Methacrylate	✓		✓	
Iodomethane	✓		✓	
Isobutyl alcohol	✓		✓	
Methacrylonitrile	✓		✓	
Methyl methacrylate	✓		✓	
Vinyl acetate	✓		✓	
Trans-1,4-dichloro-2-butene	✓		✓	
Dichlorodifluoromethane	✓		✓	
Pentachloroethane	✓		✓	
1,1,1,2-Tetrachloroethane	✓		✓	
1,2,3-Trichloropropane	✓		✓	

Notes: ✓ = Target analytes for environmental and quality control samples collected at each Solid Waste Management Unit.

Appendix IX = 40 Code of Federal Regulations Part 264, Appendix IX, Ground Water Monitoring List. Analytical Methodology for Appendix IX is Test Methods for Evaluation of Solid Wastes, US EPA, SW 846, Third Edition, November, 1986. (And Proposed Update Package, 1989.)

CLP TCL = U.S. Environmental Protection Agency Contract Laboratory Program, Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, Exhibit C, Target Compound List and Contract Required Quantitation Limits, OLM01.0, July 1993.

Table 4-2
Gas Chromatograph and Mass Spectrometer Semivolatiles
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Semivolatile Organic Compounds	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
Acid Extractables				
Phenol	✓	✓	✓	✓
2-Chlorophenol	✓	✓	✓	
2-Methylphenol	✓	✓	✓	✓
4-Methylphenol	✓	✓	✓	✓
2-Nitrophenol	✓	✓	✓	
2,4-Dimethylphenol	✓	✓	✓	✓
2,4-Dichlorophenol	✓	✓	✓	
4-Chloro-3-methylphenol	✓	✓	✓	
2,4,6-Trichlorophenol	✓	✓	✓	
2,4,5-Trichlorophenol	✓	✓	✓	
2,4-Dinitrophenol	✓	✓	✓	
4-Nitrophenol	✓	✓	✓	
2-Methyl-4,6-dinitrophenol	✓	✓	✓	
Pentachlorophenol	✓	✓	✓	✓
2,3,4,6-Tetrachlorophenol	✓		✓	
2,6-Dichlorophenol	✓		✓	
Benzoic Acid			✓	✓
Base-Neutral Compounds				
1,3-Dichlorobenzene[1]	✓	✓	✓	
1,4-Dichlorobenzene[1]	✓	✓	✓	
1,2-Dichlorobenzene[1]	✓	✓	✓	
Hexachloroethane	✓	✓	✓	
1,2,4-Trichlorobenzene	✓	✓	✓	
Naphthalene[2]	✓	✓	✓	✓
Hexachlorobutadiene	✓	✓	✓	
Hexachlorocyclopentadiene	✓	✓	✓	
2-Chloronaphthalene	✓	✓	✓	
Acenaphthylene[2]	✓	✓	✓	
Acenaphthene[2]	✓	✓	✓	✓
Dibenzofuran	✓	✓	✓	✓
Fluorene[2]	✓	✓	✓	✓
4-Chlorophenyl-phenylether	✓	✓	✓	
4-Bromophenyl-phenylether				
See notes at end of table				

Table 4-2 (Continued)
Gas Chromatograph and Mass Spectrometer Semivolatiles
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Semivolatile Organic Compounds	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
Hexachlorobenzene	✓	✓	✓	
Phenanthrene[2]	✓	✓	✓	✓
Anthracence[2]	✓	✓	✓	✓
Fluoranthene[2]	✓	✓	✓	✓
Pyrene[2]	✓	✓	✓	✓
Benzo(a)anthracene[2]	✓	✓	✓	✓
Chrysene[2]	✓	✓	✓	✓
Benzo(b)fluoranthene[2]	✓	✓	✓	✓
Benzo(k)fluoranthene[2]	✓	✓	✓	
Benzo(a)pyrene[2]	✓	✓	✓	✓
Indeno(1,2,3-cd)pyrene[2]	✓	✓	✓	
Dibenzo(a,h)anthracene[2]	✓	✓	✓	
Benzo(g,h,i)perylene[2]	✓	✓	✓	✓
bis(2-Chloroethyl)ether	✓		✓	
n-Nitroso-di-n-propylamine	✓	✓	✓	
Nitrobenzene	✓	✓	✓	
Isophorone	✓	✓	✓	
bis(2-Chloroethoxy)methane	✓	✓	✓	
Dimethylphthalate	✓	✓	✓	
2,6-Dinitrotoluene	✓	✓	✓	
2,4-Dinitrotoluene	✓	✓	✓	
Diethylphthalate	✓	✓	✓	✓
n-Nitrosodiphenylamine	✓	✓	✓	
di-n-Butylphthalate	✓	✓	✓	✓
Butylbenzylphthalate	✓	✓	✓	✓
3,3'-Dichlorobenzidine	✓	✓	✓	
bis(2-Ethylhexyl)phthalate	✓	✓	✓	✓
di-n-Octylphthalate	✓	✓	✓	✓
n-Nitrosodimethylamine	✓		✓	✓
2-Picoline	✓		✓	
Diphenylamine	✓		✓	
4-Nitroaniline	✓	✓	✓	
Benzyl alcohol	✓		✓	
n-Nitrosopiperidine	✓		✓	
n-Nitrosomethylethylamine	✓		✓	
4-Chloroaniline	✓	✓	✓	
p-Phenylenediamine	✓		✓	

See notes at end of table.

Table 4-2 (Continued)
Gas Chromatograph and Mass Spectrometer Semivolatiles
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Semivolatile Organic Compounds	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
3- and 4-Methylphenol				
bis(2-Chloroisopropyl)ether	✓	✓	✓	
Pyridine	✓		✓	
3,3'-Dimethylbenzidine	✓		✓	
Isosafrole	✓		✓	
Phenyl-tert-butylamine	✓		✓	
1,2-Diphenylhydrazine			✓	
1,4-Naphthoquinone	✓		✓	
1-Naphthylamine	✓		✓	
Aramite	✓		✓	
Hexachloropropene	✓		✓	
Pronamide	✓		✓	
2-Acetylaminofluorene	✓		✓	✓
n-Nitrosodiethylamine	✓		✓	
3-Methylcholanthrene	✓		✓	
4-Nitroquinoline-1-oxide	✓		✓	
7,12-Dimethylbenz(a)anthracene	✓		✓	
n-Nitrosomorpholine	✓		✓	
p-(Dimethylamino)azobenzene	✓		✓	
Pentachlorobenzene	✓		✓	
Phenacetin	✓		✓	
Ethyl methanesulfonate	✓		✓	
Aniline	✓		✓	
Methyl methanesulfonate	✓		✓	
Hexachlorophene	✓		✓	
Pentachloronitrobenzene	✓		✓	
2-Nitroaniline	✓	✓	✓	
2-Methylnaphthalene[2]	✓	✓	✓	✓
2-Naphthylamine	✓		✓	
Methapyrilene	✓		✓	
4-Aminobiphenyl	✓		✓	
Benzidine			✓	
n-Nitroso-di-n-butylamine	✓		✓	
n-Nitrosopyrrolidine	✓		✓	
Safrole	✓		✓	
o-Toluidine	✓		✓	
1,2,4,5-Tetrachlorobenzene	✓		✓	

See notes at end of table.

Table 4-2 (Continued)
Gas Chromatograph and Mass Spectrometer Semivolatiles
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Semivolatile Organic Compounds	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
Acetophenone	✓		✓	
3-Nitroaniline	✓	✓	✓	
1,3,5-Trinitrobenzene	✓		✓	
5-Nitro-o-toluidine	✓		✓	
1,3-Dinitrobenzene	✓		✓	
Carbazole		✓		

[1] Analyte is both a volatile and semivolatile target analyte.
[2] Analyte is a polynuclear aromatic hydrocarbon.

Notes: ✓ = Target analytes for environmental and quality control samples collected at each Solid Waste Management Unit.

Appendix IX = 40 Code of Federal Regulations Part 264, Appendix IX, Ground Water Monitoring List. Analytical Methodology for Appendix IX is Test Methods for Evaluation of Solid Wastes, US EPA, SW 846, Third Edition, November, 1986. (And Proposed Update Package, 1989.)

CLP TCL = U.S. Environmental Protection Agency Contract Laboratory Program, Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, Exhibit C, Target Compound List and Contract Required Quantitation Limits, OLM01.0, July 1993.

Table 4-3
Gas Chromatograph Pesticides, Herbicides and Polychlorinated Biphenyls Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Pesticides, Herbicides and Polychlorinated Biphenyls	Appendix IX	CLP TCL	Currently A Target Analyte	Detected at NAVSTA Mayport
Organochlorine Pesticides				
alpha-Benzene hexachloride (BHC)	✓	✓	✓	✓
beta-BHC	✓	✓	✓	✓
delta-BHC	✓	✓	✓	✓
gamma-BHC (Lindane)	✓	✓	✓	
Heptachlor	✓	✓	✓	✓
Aldrin	✓	✓	✓	
Heptachlor epoxide	✓	✓	✓	✓
Endosulfan I	✓	✓	✓	
Dieldrin	✓	✓	✓	
4,4'-Dichlorodiphenyldichloroethylene (4,4'-DDE)	✓	✓	✓	✓
Endrin	✓	✓	✓	
Endosulfan II	✓	✓	✓	
4,4'-Dichlorodiphenyldichloroethane (4-4'-DDD)	✓	✓	✓	✓
Endosulfan sulfate	✓	✓	✓	
4,4'-Dichlorodiphenyltrichloroethane (4,4'-DDT)	✓	✓	✓	✓
Methoxychlor	✓	✓	✓	
Endrin keytone		✓	✓	
Endrin aldehyde	✓	✓	✓	
alpha-Chlordane	✓	✓	✓	✓
gamma-Chlordane	✓	✓	✓	✓
Toxaphene	✓	✓	✓	
Organophosphorus Pesticides				
Aspon-SS	✓		*	
Triethylphosphorothioate	✓		*	
Thionazin	✓		*	
Parathion methyl	✓		*	
Phorate	✓		*	
Disulfoton	✓		*	
Sulfotepp	✓		*	
Famphur	✓		*	
Parathion ethyl	✓		*	
Dimethoate				

See notes at end of table.

Table 4-3 (Continued)
Gas Chromatograph Pesticides, Herbicides and Polychlorinated Biphenyls
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Compound List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Pesticides, Herbicides and Polychlorinated Biphenyls	Appendix IX		Currently A Target Analyte	Detected at NAVSTA Mayport
Chlorinated Herbicides				
2,4-Dichlorophenylacetic acid			*	
3,5-Dichlorobenzoic acid			*	
Dinoseb	✓		*	
(2,4,5-Trichlorophenoxy)-acetic acid (2,4,5-T)	✓		*	
α-(2,4,5-Trichlorophenoxy) propionic acid (2,4,5-TP) (Silvex)	✓		*	
2,4-Dichlorophenoxyacid (2,4-D)			*	
Polychlorinated Biphenyls (PCBs)				
Aroclor-1016	✓	✓	✓	
Aroclor-1221	✓	✓	✓	
Aroclor-1232	✓	✓	✓	
Aroclor-1242	✓	✓	✓	
Aroclor-1248	✓	✓	✓	✓
Aroclor-1254	✓	✓	✓	
Aroclor-1260	✓	✓	✓	✓

Notes: ✓ = Target analytes for environmental and quality control samples collected at each Solid Waste Management Unit.

* = Target analytes for environmental and quality control samples collected at pesticide handling and storage sites.

Appendix IX = 40 Code of Federal Regulations Part 264, Appendix IX, Ground Water Monitoring List. Analytical Methodology for Appendix IX is Test Methods for Evaluation of Solid Wastes, US EPA, SW 846, Third Edition, November, 1986. (And Proposed Update Package, 1989.)

CLP TCL = U.S. Environmental Protection Agency Contract Laboratory Program, Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, Exhibit C, Target Compound List and Contract Required Quantitation Limits, OLM01.0, July 1993.

Table 4-4
Inorganics and Cyanide
Comparison of Target Analytes From Resource Conservation and Recovery Act Appendix IX Ground Water Monitoring List and U.S. Environmental Protection Agency Contract Laboratory Program Target Analyte List

RFI Workplan, Addendum No. 5
U.S. Naval Station Mayport
Mayport, Florida

Inorganics and Cyanide	Appendix IX	CLP TAL	Currently A Target Analyte	Detected at NAVSTA Mayport
Aluminum		✓		
Antimony	✓	✓	✓	✓
Arsenic	✓	✓	✓	✓
Barium	✓	✓	✓	✓
Beryllium	✓	✓	✓	✓
Cadmium	✓	✓	✓	✓
Calcium		✓	✓	✓
Chromium	✓	✓	✓	✓
Cobalt	✓	✓	✓	✓
Copper	✓	✓	✓	✓
Iron		✓	✓	✓
Lead	✓	✓	✓	✓
Magnesium		✓	✓	✓
Manganese		✓	✓	✓
Mercury	✓	✓	✓	✓
Nickel	✓	✓	✓	✓
Potassium		✓	✓	✓
Selenium	✓	✓	✓	✓
Silver	✓	✓	✓	✓
Sodium		✓	✓	✓
Thallium	✓	✓	✓	✓
Tin	✓		✓	✓
Vanadium	✓	✓	✓	✓
Zinc	✓	✓	✓	✓
Cyanide	✓	✓	✓	✓

Notes: ✓ = Target analytes for environmental and quality control samples collected at each Solid Waste Management Unit.

Appendix IX = 40 Code of Federal Regulations Part 264, Appendix IX, Ground Water Monitoring List. Analytical Methodology for Appendix IX is Test Methods for Evaluation of Solid Wastes, US EPA, SW 846, Third Edition, November, 1986. (And Proposed Update Package, 1989.)

CLP TAL = U.S. Environmental Protection Agency Contract Laboratory Program, Statement of Work for Inorganic Analysis, Multi-Media, Multi-Concentration, Target Analyte List and Contract Required Quantitation Limits, ILM0 1.0, March 1990.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC standards and procedures will comply with the approved QAPP and Site-Specific Quality Assurance Plan (QAP) contained in Appendices A and B, respectively, of the NAVSTA Mayport RFI Workplan, Volume II (ABB-ES, 1991). QA/QC samples will be collected in accordance with Chapter 11.0 of the QAPP. Decontamination of field sampling equipment will be in accordance with Section 6.3 of the QAPP and the Technical Memorandum, *Decontamination Procedures*, located in Appendix B of the NAVSTA Mayport RFI Workplan (ABB-ES, 1991). Sample handling and project documentation will be in accordance with Section 3.1 of the NAVSTA Mayport RFI Workplan, Volume II, and the referenced sections in the QAPP. Laboratory QA/QC will be in accordance with the laboratory QAPP located in Appendix C of the NAVSTA Mayport RFI Workplan, Volume II (ABB-ES, 1991).

6.0 HEALTH AND SAFETY

Health and safety requirements will be in accordance with the general health and safety Plan (HASP) located in Volume III of the NAVSTA Mayport RFI workplan (ABB-ES, 1991).

7.0 SCHEDULE

The proposed schedule for completion of Group III SWMU RFI activities assumes ready access to all sites and no delays due to the securing of required permits (Figure 7-1). The schedule may be modified by the nature and extent of contamination that may be found at an SWMU and the determination that new data may need to be collected. The schedule also may be modified by the regulatory review cycles.

MPT_GRP3.RFI
MVL11.94

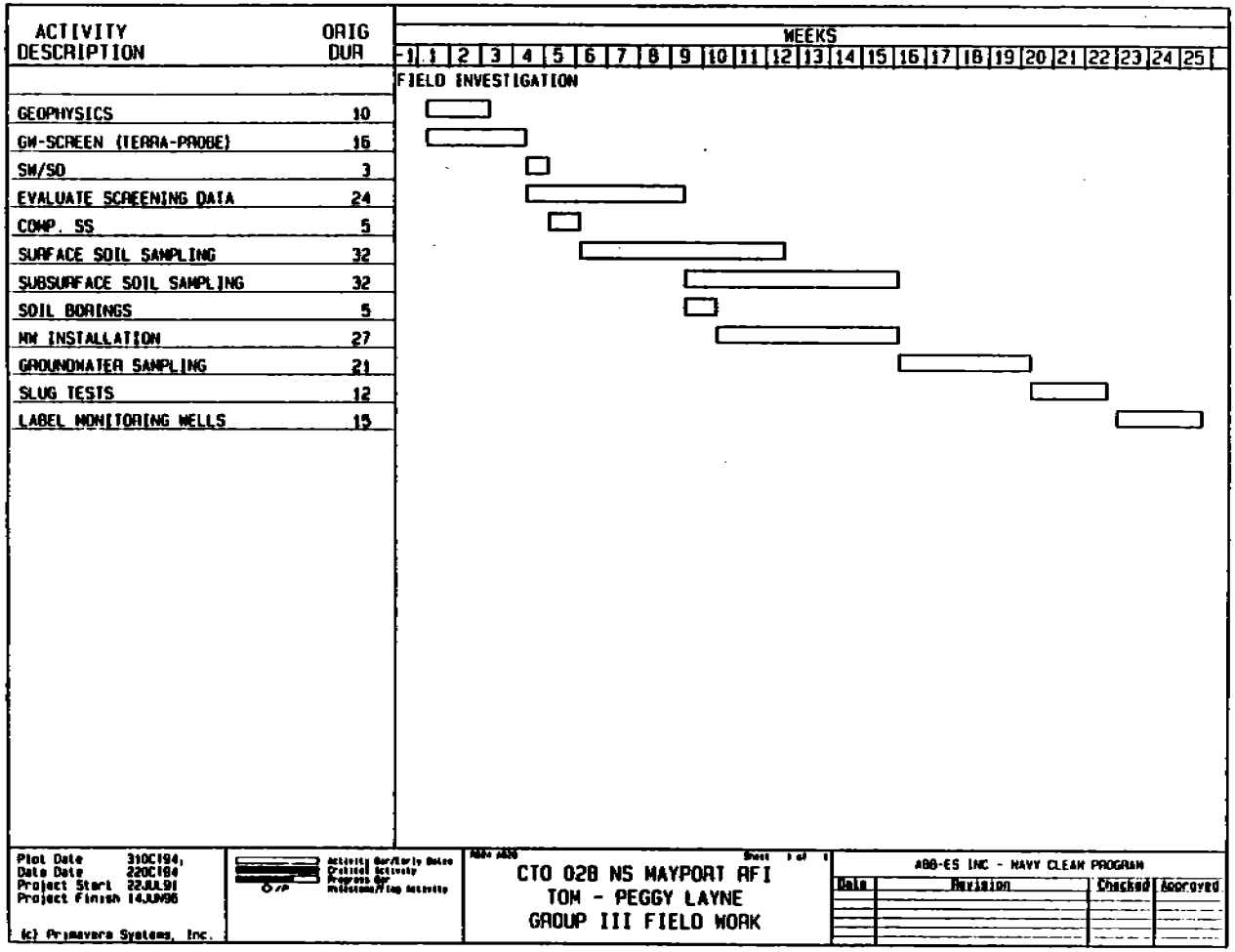

FIGURE 7-1
PROJECT SCHEDULE

RCRA FACILITY INVESTIGATION
WORKPLAN, ADDENDUM 5

U.S. NAVAL STATION
MAYPORT, FLORIDA

H:\MAYPORT\TITLE\WDW\11-14-94

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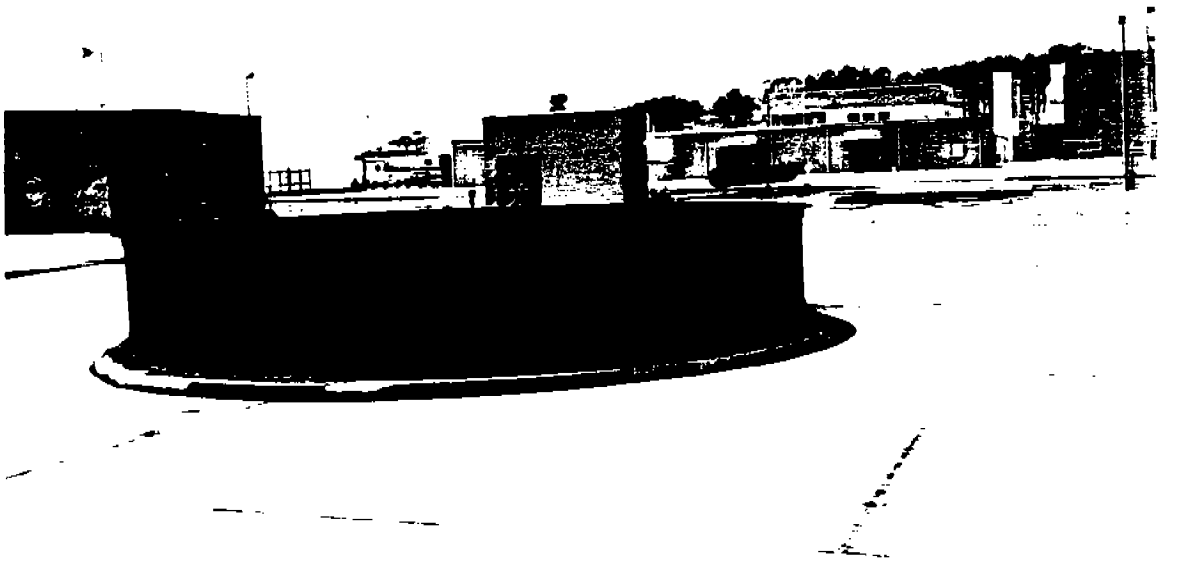
APPENDIX A

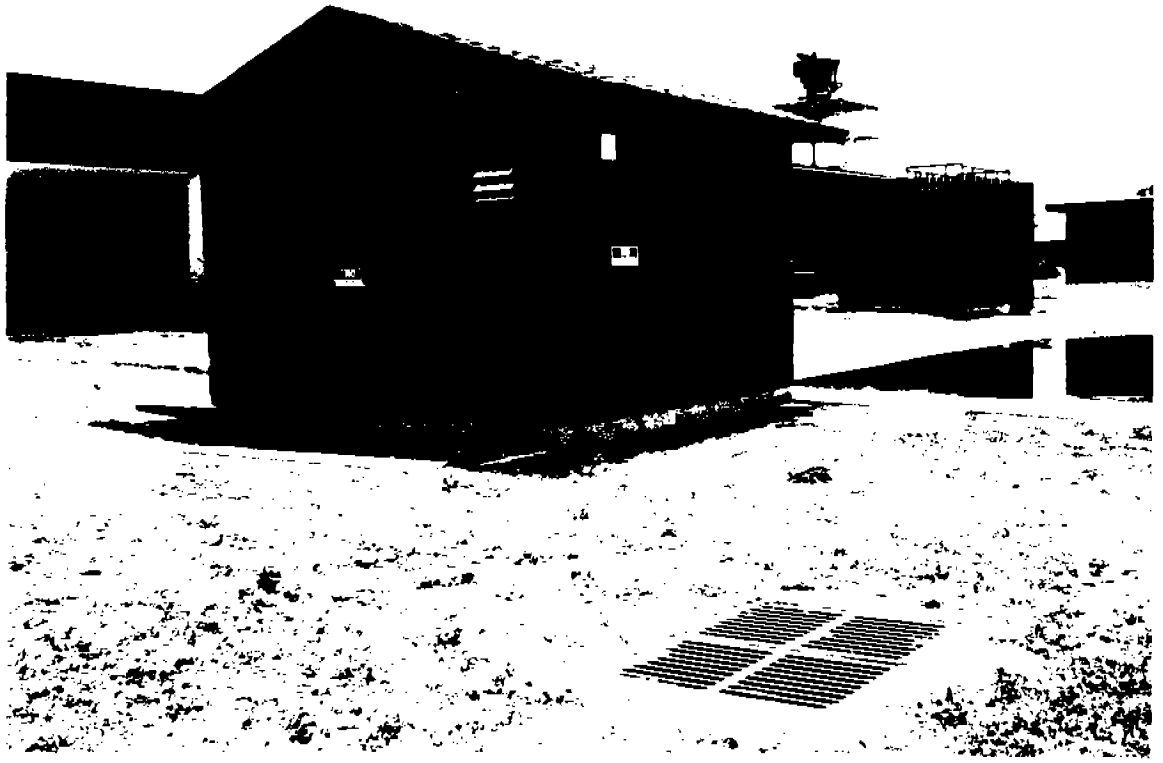
Photographs

Fire Fighting Training Area: View looking west of the concrete-lined detection pond and the two confined area simulators.

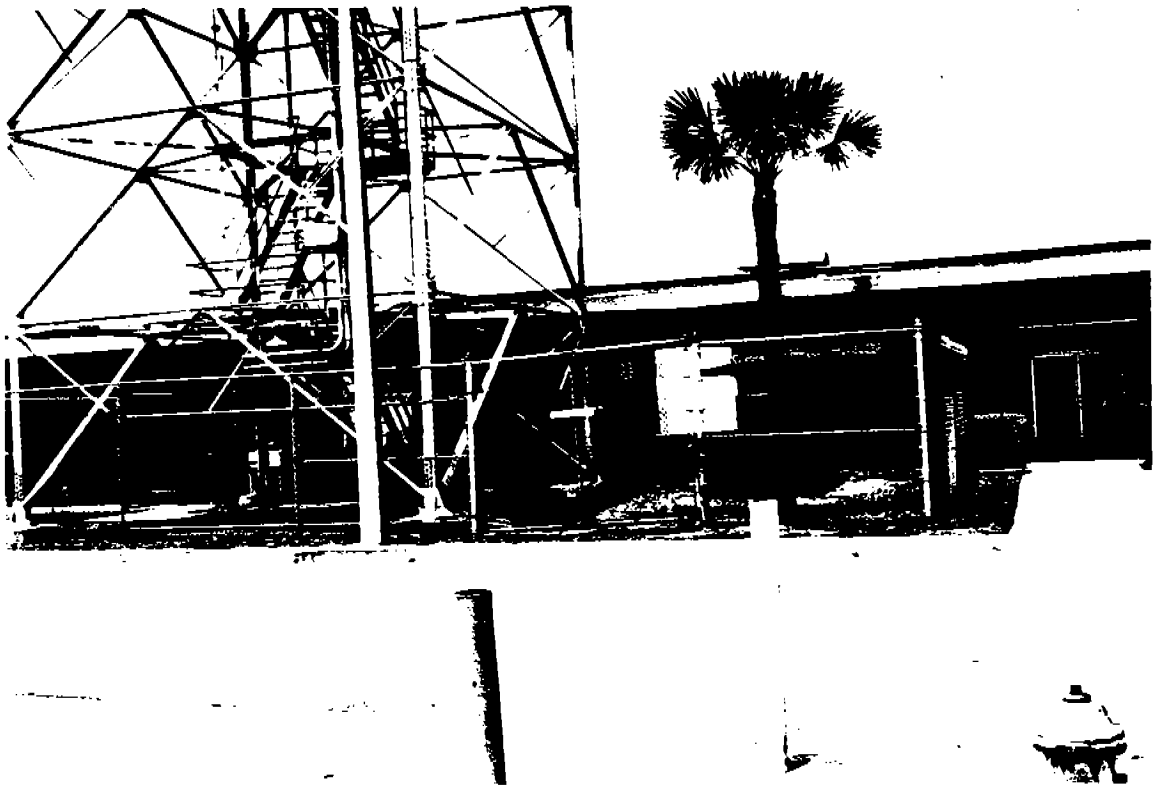


Fire Fighting Training Area: View looking southwest of a circular-shaped half tank, a confined area simulator at the left and the airplane mockup over the right corner of the airplane mockup.

Fire Fighting Training Area: View looking west at helicopter mockup. The oil-water separator was formerly located near the drain inlet left of the center of the photograph. The Mercuric nitrate was reported (A.T. Kearney, 1979) to be stored in the area on the right side of the photograph. The new Fire Fighting Area is behind the helicopter mockup.



Fire Fighting Training Area: View looking south at the pump house for the fire fighting waste liquid transfer to the waste water treatment plant. The concrete detection pond is on the right side of the photographs. An air conditioner is the structure at the top right of the photograph.



SWMU 18 FTC Diesel Generator Sump: View looking north. The diesel generator is located behind the palm tree. The radar antenna tower is the structure on the left side of the photograph.

SWMU 18 FTC Diesel Generator Sump: View looking west. Diesel generator is located at the right and behind the green electric box.

SWMU 17 Carbonaceous Fuel Boiler: View looking north along western side of the Carbonaceous Fuel Boiler Building. Manway to one of the 6,000-gallon capacity underground storage tanks.

SWMU 17 Carbonaceous Fuel Boiler: View looking south along the western side of the Carbonaceous Fuel Boiler Building. Manways to the 6,000-gallon capacity underground storage tanks.

APPENDIX B

Fly Ash Extraction Procedure Toxicity Analytical Data

Enviropact of Jacksonville, Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354-6755
Fla. Wats: (800) 432-9706

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

February 26, 1986

Report # J 6993
Lab I.D. # 82223

Date Sampled: 2/19/86 Collected by: M. Hennis.
Sample Designation: Work Order # 2907-019
Contract # N62467-86-C-2907

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

Cadmium	6.70	mg/l
Lead	< 0.50	mg/l

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 5

To FRAN LESESNE	From CHERYL MITCHELL
Co.	Co.
Dept.	Phone #
Fax # 904-877-0742	Fax #

Enviropact of Jacksonville Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354 6755
Fla. Wats: (800) 432 9706

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

February 28, 1986

Report # J 6558
Lab I.D. # 82223

Date Sampled: 2/13/86 Collected by: M. Hennis.
Sample Designation: Work Order # 2907-013
Contract # N62467-86-C-2907

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

Arsenic	< 0.05	mg/l
Mercury	< 0.01	mg/l
Selenium	< 0.05	mg/l
Cadmium	3.32	mg/l
Chromium	< 0.50	mg/l
Lead	18.3	mg/l
Silver	< 0.50	mg/l
Barium	< 1.00	mg/l

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

Enviropact of Jacksonville, Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354-8755
Fla. Wats: (800) 432-9706

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

February 26, 1986

Report # J 6566
Lab I.D. # 82223

Date Sampled: 2/14/86 Collected by: M. Hennis.
Sample Designation: Work Order # 2907-014
Contract # N62467-86-C-2907

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

	DRY ASH	
Cadmium	5.62	mg/l
Lead	12.2	mg/l

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

Enviropact of Jacksonville, Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354-6755
Fla. Wats: (800) 432-9708

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

February 27, 1986

Report # J 7023
Lab I.D. # 82223

Date Sampled: 2/21/86 Collected by: M. Hennis.
Sample Designation: Work Order # 2907-021
Contract # N62467-86-C-2907

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

Cadmium	2.18	mg/l
Lead	12.0	mg/l

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

Enviropact of Jacksonville, Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354 6755
Fla. Wats: (800) 432-9706

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

February 27, 1986

Report # J 7025
Lab I.D. # 82223

Date Sampled: 2/22/86 Collected by: M. Hennis.
Sample Designation: Work Order # 2907-022
Contract # N62467-86-C-2907

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

Cadmium	3.70	mg/l
Lead	3.40	mg/l

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

NORTHEAST DISTRICT
3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207
(904) 396-6959

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ERNEST E. FREY
DISTRICT MANAGER

March 24, 1986

Mr. Jose R. Negron
Environmental Engineer
U S. Naval Air Station-Mayport
Code N4 214
Mayport, Florida 32228-5000

Dear Mr. Negron:

NAS - Mayport - HW
Dry Ash from solid waste boiler

This is in reference to the results of testing program on the Dry Ash from the solid waste boiler located at Building 1430, Naval Station, Mayport.

The results indicate the Dry Ash exhibits the characteristic of E.P. Toxicity for the parameters Cadmium and Lead, making this ash a hazardous waste regulated under the provisions of Chapter 17-30, Florida Administrative Code.

The Navy must immediately manage and dispose of this ash as a hazardous waste pursuant to the applicable regulations of 40 CFR 260-265, including the ash collected during the testing program.

If you have any questions concerning this matter, please contact this office.

Sincerely,

Phillip M. Coram, Supervisor
Hazardous Waste Section

PMC/sb

cc: Mary Nogas

Enviropact of Jacksonville, Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354-6755
Fla. Wats: (800) 432-9706

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

February 26, 1986

Report # J 6989
Lab I.D. # 82223

Date Sampled: 2/18/86

Collected by: M. Hennis.

Sample Designation: [illegible] Order # 2907-018
Work Order # 2907-018
Contract # N62467-86-C-2907

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

	DRY ASH	
Cadmium	2.46	mg/l
Lead	< 0.50	mg/l

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

Enviropact of Jacksonville, Inc.
Environmental Consulting and Analysis

1627 East 8 Street
Jacksonville, Florida 32206
Telephone: (904) 354-6755
Fla. Wats: (800) 432-9706

Client: Commanding Officer
ATT: Mr. Steve Stouter
Code # N4214
Naval Station
Mayport, FL 32228

March 6, 1986

Report # J 6988
Lab I.D. # 82223

Date Received: 2/18/86 Collected by: Your Rep.
Sample Designation: Work Order # 2907-014
Contract # N62467-86-C-2907
Fuel sample

REPORT OF ANALYSIS

EXTRACTION PROCEDURE TOXICITY:

Arsenic	< 0.05	mg/l
Mercury	< 0.01	mg/l
Selenium	< 0.05	mg/l
Cadmium	< 0.50	mg/l
Chromium	< 0.50	mg/l
Lead	< 0.50	mg/l
Silver	< 0.50	mg/l
Bromine	< 1.00	mg/l

BTU	15,539	BTU/lb
Water Content	< 0.05	%
Total Chloride	< 0.01	%
% Ash	0.03	%

Analysis made in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully submitted,

Chris Given
Laboratory Supervisor

FIRST COAST ENVIRONMENTAL LABORATORY, INC.

FLY ASH ANALYSIS

April 28, 1994

Client: Global Associates
Lab #: 9404-116
Sample I.D.: Fly Ash - Dry
Date Received: 4-19-94
Sample Matrix: TCLP Extract
Date Completed: 4-27-94

Metals Analytical Summary
Toxicity Characteristic Leaching Procedure SW-846 Method 1311

Parameter	SW-846 Method	CAS #	Detection Limit(mg/L)	RESULT(mg/L)	Max. Cont. Level(mg/L)
Cadmium	6010	7440-43-9	0.00532	0.021	1.0
Chromium	6110	7440-47-3	0.0140	0.654	5.0
Lead	6010	7439-92-1	0.0307	0.121	5.0

SW-846 -- "Test Methods for Evaluating Solid Waste", Third Edition, November, 1986, and Revision 1, December, 1987, and 55 FR (61) 11862 - 11875.

Respectfully submitted,

Adolph W. Wollitz
Laboratory Director
FHRS Lab #E82102
FHRS Lab #82110
EPA #FL062
DEP Comp QAPP # 870222G

AWW/tb

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 14-16

To FRAN LESESNE	From CHERYL MITCHELL
Co.	Co.
Dept.	Phone #
Fax # 904-877-0742	Fax #

8818 Arlington Expressway • Jacksonville, Florida 32211
(904) 725-4847 • Fax (904) 725-2215

FIRST COAST ENVIRONMENTAL LABORATORY, INC.

January 21, 1993

Client: Global Associates

Sample I.D.: Fly Ash - Dry

Sample Matrix: TCLP Extract

Lab #: 9212-168

Date Received: 12-29-92

Date Completed: 1-21-93

Metals Analytical Summary
Toxicity Characteristic Leaching Procedure SW-846 Method 1311

Parameter	SW-846 Method	CAS #	Detection Limit(mg/L)	RESULT(mg/L)	Max. Cont. Level(mg/L)
Cadmium	6010	7440-43-9	0.0282	69.11	1.0
Chromium	6010	7440-47-3	0.0269	< 0.0269	5.0
Lead	6010	7439-92-1	0.0232	16.83	5.0

SW-846 -- "Test Methods for Evaluating Solid Waste", Third Edition, November, 1986, and Revision 1, December, 1987, and 55 FR (61) 11862 - 11875.

Respectfully submitted,

Adolph W. Wollitz
Laboratory Director
DER Comp QAPP # 870222G

AWW/tb

8818 Arlington Expressway • Jacksonville, Florida 32211
(904) 725-4847 • Fax (904) 725-2215

DEPARTMENT OF THE NAVY
NAVAL STATION
MAYPORT, FLORIDA 32228-5000

IN REPLY REFER TO:
5090
Ser N422/ 001087
9 May 89

Mr. George Groves
Florida Department of Environmental Regulation
3426 Bills Road
Jacksonville, Florida 32207

Dear Mr. Groves:

In response to your letter of February 3, 1989, Naval Station Mayport has performed additional analyses of the ash from the carbonaceous fuel boiler. Enclosed are the results of these analyses. The fly ash was tested separately and the bottom ash and boiler ash were combined before sampling. Based on these analyses, Naval Station Mayport requests that the classification be changed form hazardous waste to non-hazardous waste.

Should you have further questions, contact Mr. Michael Davenport at 241-6730.

Sincerely,

J. S. VEAL
Director, Engineering Division
By direction of the Commanding Officer

Encl:
(1) Analyses Report

ENVIROPACT, INC.

1627 East 8th Street
Jacksonville, Florida 32206-5407
(904) 354-6755 Fax No. (904) 354-3799

April 18, 1989
Report 3047

LAB I.D. 82223

22801
NS MAYPORT
COMMANDING OFFICER
CODE #4214, NS
MAYPORT, FL 32228
ATT : MR. MICHAEL DAVENPORT
Sample Collected: 3/31/89
Sample Received: 4/03/89
Sample Description:FLYASH

Collected By: M. HENNIS

REPORT OF ANALYSIS : BLDG 1430 FLYASH HOPPER		UNITS	DATE
E P TOX Arsenic	<0.05	mg/l	4/11/89
E P TOX Barium	<1.0	mg/l	4/11/89
E P TOX Cadmium	<0.5	mg/l	4/13/89
E P TOX Chromium	<0.5	mg/l	4/11/89
E P TOX Lead	<0.50	mg/l	4/12/89
E P TOX Mercury	0.01	mg/l	4/14/89
E P TOX Selenium	<0.05	mg/l	4/11/89
E P TOX Silver	<0.50	mg/l	4/11/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully Submitted,

Chris Given
Laboratory Manager
Enviropact Services, Inc.

Encl (1)

ENVIROPACT

22801
NS MAYPORT
COMMANDING OFFICER
CODE #4214, NS
MAYPORT, FL 32228
ATT : MR. MICHAEL DAVENPORT
Sample Collected: 3/31/89
Sample Received: 4/03/89
Sample Description: FLYASH

April 18, 1989
Report 3047

LAB ID. 82223

Collected By: M. HENNIS

Bottom Ash / Boiler

REPORT OF ANALYSIS : BLDG 1430 FROM DRUM 3-28		UNITS	DATE
E P TOX Arsenic	<0.05	mg/l	4/11/89
E P TOX Barium	<1.0	mg/l	4/11/89
E P TOX Cadmium	<0.5	mg/l	4/13/89
E P TOX Chromium	<0.5	mg/l	4/11/89
E P TOX Lead	<0.50	mg/l	4/12/89
E P TOX Mercury	0.07	mg/l	4/14/89
E P TOX Selenium	<0.05	mg/l	4/11/89
E P TOX Silver	<0.50	mg/l	4/11/89

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully Submitted,

Chris Given
Laboratory Manager
Enviropact Services, Inc.

DEPARTMENT OF THE NAVY
NAVAL STATION
MAYPORT, FLORIDA 32228-5000

IN REPLY REFER TO:
5090
Ser N422/004523
20 Dec 88

Florida Department of Environmental Regulation
3426 Bills Road
Jacksonville, FL 32207

Subj: DRY ASH FROM SOLID WASTE BOILER

Dear Sirs:

In accordance with your letter dated March 24, 1986, Naval Station Mayport has been disposing of dry ash as hazardous waste from Building 1430, solid waste boiler. However, improvements in segregation has reduced the levels of EP toxic metals.

Enclosed please find a copy of analysis of the Dry Ash from Naval Station Mayport's solid waste boiler. These analyses clearly show that the ash is not a hazardous waste for EP toxic metals. Naval Station Mayport requests authorization to treat this dry ash as a non-hazardous waste and dispose at the City's landfill. The quantities generated per year will be approximately 100 tons.

Should there be additional questions, please contact Mr. Steve Stouter, (904) 246-5268 or Mr. Michael Davenport, (904) 241-6730.

Sincerely,

J. S. VEAL
Director, Engineering Division
By direction of the Commanding Officer

Encl:
(1) Analysis Report

Copy to:
Ms. Mary C. Nogas
City of Jacksonville
1231 E. Beaver St.
Jacksonville, FL 32202

Mr. G. J. Benjock (Code 11423)
Southern Division
Naval Facilities Engineering Command
P.O. Box 10068
Charleston, SC 29411-0068

ENVIROPACT

22801
NS MAYPORT
COMMANDING OFFICER
CODE #4214, NS
MAYPORT, FL 32228
ATT : MR. MICHAEL DAVENPORT

November 2, 1988
Report 1749

LAB I.D. 82223

Sample Collected: 10/03/88
Sample Received: 10/06/88 Collected By: R. MYER
Sample Description: CONTRACT # N62467-88-M-2928
WO # 2928-18
EP TOX METALS / BLDG 1430

REPORT OF ANALYSIS : DUST COLLECTOR		UNITS	DATE
E P Toxicity Set Up	done		10/10/88
E P TOX Arsenic	<0.05	mg/l	10/24/88
E P TOX Barium	<1.0	mg/l	10/11/88
E P TOX Cadmium	<0.5	mg/l	10/11/88
E P TOX Chromium	<0.5	mg/l	10/11/88
E P TOX Lead	<0.5	mg/l	10/11/88
E P TOX Mercury	<0.10	mg/l	10/17/88
E P TOX Selenium	<0.05	mg/l	10/25/88
E P TOX Silver	<0.5	mg/l	10/11/88

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully Submitted,

Chris Given
Laboratory Manager
Enviropact Services, Inc.

ENVIROPACT SERVICES, INC.
JACKSONVILLE DIVISION
1627 EAST 8th STREET
JACKSONVILLE, FL 32206 5407
904-354-6755

Encl (1)

22801
NS MAYPORT
COMMANDING OFFICER
CODE #4214, NS
MAYPORT, FL 32228
ATT : MR. MICHAEL DAVENPORT

November 2, 1988
Report 1749

LAB ID. 82223

Sample Collected: 10/03/88
Sample Received: 10/06/88
Collected By: R. MYER
Sample Description: CONTRACT # N62467-88-M-2928
WO # 2928-18
EP TOX METALS / BLDG 1430

REPORT OF ANALYSIS : MAIN STACK		UNITS	DATE
E P Toxicity Set Up	done		10/10/88
E P TOX Arsenic	<0.05	mg/l	10/24/88
E P TOX Barium	<1.0	mg/l	10/11/88
E P TOX Cadmium	<0.5	mg/l	10/11/88
E P TOX Chromium	<0.5	mg/l	10/11/88
E P TOX Lead	<0.5	mg/l	10/11/88
E P TOX Mercury	<0.10	mg/l	10/17/88
E P TOX Selenium	<0.05	mg/l	10/25/88
E P TOX Silver	<0.5	mg/l	10/11/88

Analyses performed in accordance with E.P.A., A.S.T.M., Standard Methods or other approved methods.

Respectfully Submitted,

Chris Given
Laboratory Manager
Enviropact Services, Inc.

6321 NO VON

APPENDIX C

Response to FDEP Comments on Draft Workplan

Response to Comments
Florida Department of Environmental Protection (FDEP)
August 1994
Group III Resource Conservation and Recovery Act (RCRA)
Facility Investigation (RFI) Workplan

General 1 **Has a contract been let for the activities proposed in this Workplan, and what is the anticipated start date for the work to begin?**

Currently, a task order has not been issued by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to commence the field activities for the Group III Solid Waste Management Units (SWMUs). The start date is dependent upon funding for fiscal year 95; however, the anticipated start date is March 1995.

General 2 **Tables 2-1 through 2-4 and Tables 4-2 through 4-5 are presented and indicate Quantitation Limits and Guidance or Promulgated levels for screening and detection of possible contaminants. Updates on State of Florida promulgated and guidance levels were presented to members of the EPA, Navy, and ABB at a meeting held July 27 through July 30, 1994. Updated information should be used in this and future investigations.**

The purpose of Tables 2-1 through 2-4 was to present information collected from background environmental samples collected during field activities at Group I SWMUs in 1992 and Group II in 1993. The screening levels provided by the FDEP have not been compared to these data. The Navy, FDEP, and the U.S. Environmental Protection Agency (USEPA) should come to a consensus on appropriate screening criteria for each environmental medium (soil, sediment, surface water, sludge, and groundwater).

The analytes and quantification limits listed in Tables 4-2 through 4-5 are based on 40 CFR 268, Appendix IX, Groundwater Monitoring List. The purpose of Tables 4-2 through 4-5 is to list the target analytes, not to provide screening levels.

Specific 1 **Section 2.4, page 2-3 indicates that a Technical Memorandum regarding Background levels has been prepared. This document carries the date 1994b. It does not appear that this document has been forwarded to FDEP, although Tech Memo errata with the date of April 1994 has been received. Please elaborate.**

Two copies of the draft *Technical Memorandum Background Characterization Activities RCRA Facility Investigation, NAVSTA Mayport, Florida* (ABB-ES, 1993) were sent to Eric Nuzie at FDEP on October 12, 1993. A replacement copy can be forwarded to FDEP if the document originally submitted is not found.

SWMUs 1, 23, 24, 25, 44, and 45

Section 3.1.1

1. **Page 3-2. The SWMU 1 discussion indicates that 27 drums of xylene and scrap material were uncovered during the excavation for the new clarifiers. Please provide a more detailed description of the location of these materials and their disposition.**

   No documentation has been found describing the excavation and disposition of the drums of xylene and scrap metal unearthed during construction of the new clarifier. This information was obtained from personal interviews; no maps were made of the location of the drums, nor is any more exact information concerning their contents available. However, NAVSTA Mayport personnel have confirmed that the drums were disposed through NAVSTA Mayport's permitted Part B Facility.

2. **Page 3-6 and Figure 3-3. The SWMU 23 discussion regarding petroleum storage tanks does not discuss Tank 2 located near Structure 24. Please elaborate.**

   Paragraph 2 on page 3-6 did not adequately describe the history of underground storage tanks at Jacksonville Shipyard, Inc. (JSI). Two of these underground storage tanks were located west of Building 48 and are shown on Figure 3-3, page 3-7, as Tanks 1 and 2 and a third underground storage tank was shown as Tank 2 at location 24. The text on page 3-6 and Figure 3-3 will both be amended to show the tank at location 24 to be Tank 3.

   Underground storage Tanks 1 and 2 west of the welding shop (Building 48) had a total capacity of 3,000 gallons and contained gasoline (figure titled Jacksonville Shipyard Lease Area, Mayport N.S., dated July 31, 1974, Public Works Department [PWD] drawing no. 1981). One of the tanks was suspected of having a leak, and one or both of the tanks were reported to be removed in 1972 (A.T.Kearney, Inc., 1989). However, documentation of the removal activities has not been found, and PWD drawing No. 1981, dated July 31, 1974, shows both tanks as existing.

   The tank at location 24 on Figure 3-3 was installed in 1980 and is reported to be a 4,000-gallon gasoline tank (A.T. Kearney, Inc., 1989). NAVSTA Mayport personnel indicated to ABB-ES that this tank was also suspected of leaking and was removed in 1989. Documentation of the removal has not been found. The location of gasoline pump(s), but not the tank, are shown on PWD drawing No. 1981, dated July 31, 1974.

3. **Figure 3-3, SWMU 23. This figure indicates the area around former Bldg. 48 as a solvent area but there is no discussion. Please elaborate.**

   The area around the welding shop (Building 48) was included as a potential source of solvent contamination because solvents are often used to clean metal parts prior to welding. No records have been found suggesting a solvent release occurred in the area around Building 48; therefore, the area will be deleted from Figure 3-3. However, soil samples from the welding shop area will be collected as part of the sampling program.

4. **Page 3-12, SWMU 44. The discussion indicates that the clarifiers may have leaked in the past from "hairline" fractures. During a recent site visit it appeared that there may be leakage at the current time. Have the clarifiers been satisfactorily repaired or are they still sites of continuing leakage and contamination? Is there a monitor system in place to determine if leakage is occurring?**

NAVSTA Mayport is planning to obtain cost and schedule from contractors to epoxy line the clarifiers. The Navy plans to discontinue use of the clarifiers for temporary storage of fire-fighting training (FFT) wastewater as soon as the new fire-fighting training area becomes operational. This is currently scheduled for the fourth quarter of 1995.

5. **Page 3-14, SWMU 45. It is not clear from the discussion of the sludge drying beds if they are currently being used for any activity or purpose? Is it possible to determine whether the underdrain system exists? How deep is the bed area?**

The sludge drying beds have not been in regular use since 1985; however, when storage dumpsters at NAVSTA Mayport's wastewater treatment plant (WWTP) are full, the sludge drying beds have been used as a temporary staging area. The WWTP has been instructed by NAVSTA Mayport's Staff Civil Engineer Department to stop this practice. The material currently in beds will be removed and properly disposed.

Available documentation contains conflicting information regarding the existence of the underdrain system. NAVSTA Mayport WWTP personnel have indicated to ABB-ES that it does not exist. Therefore, during the Group III field activities, borings will be conducted to collect soil samples to determine the existence of the underdrain system.

6. **Figure 3-5 does not show all of the areas of potential contamination as indicated on Figure 3-3. Please make the necessary changes.**

Figure 3-5 will be modified.

7. **Figure 3-6 and Figure 3-9 have labeled the clarifiers differently. Please make the necessary corrections.**

Figure 3-9 will be modified to include Clarifier No. 3.

Section 3.1.2

1. **Page 3-17, references a Special Purpose Investigation in the vicinity of the JSI Administration Bldg. This document has not been received by FDEP. Since a summary of the information is being used in the Workplan, a copy of the document should be forwarded for FDEP files and information.**

A copy of the *Special-Purpose Investigation, Former Jacksonville Shipyard Administration Building, Naval Station Mayport, Florida, January 1994*, has been forwarded to USEPA and FDEP.

2. **Figures 3-9 and 3-10 do not show the location of soil samples SS-01 through SS-04, in addition there is no discussion of PCBs as a possible exposure risk to construction workers. The sampling intervals (depth) for the 1st and 2nd phase of investigation are not discussed.**

Figure 3-9 and 3-10 are correct. The naming system used during the special-purpose investigation includes four composite samples, MPT-01-SS01 through MPT-01-SS04, which were collected at the four areas shown on Figure 3-9. The locations for each of the individual samples that were composited are labeled with the letters "A", "B" and "C". Six grab sample locations also are depicted on Figure 3-9, including surface soil samples MPT-01-SS05 through MPT-01-SS07, and soil boring locations MPT-01-BS01 through MPT-01-BS03.

The highest detected concentration of a PCB (Aroclor-1248) was 1.5 milligrams per kilogram (mg/kg). The USEPA has established a residential cleanup level of 1 mg/kg and industrial cleanup levels between 10 to 25 mg/kg (USEPA, 1990) for PCBs. Therefore, PCBs were determined not to pose an adverse health risk to industrial workers.

Soil sampling proposed for the Group III RFI includes analyses for PCBs (USEPA Method 8080). The risk assessment for the Group III sites will evaluate all appropriate data to calculate and estimate potential risk to humans and ecological receptors by the chemical hazards detected at the site, including PCBs.

Surface soil was collected from the land surface to a depth of 1 foot below land surface (bls). Subsurface soil samples were collected from 3 to 4 feet bls, the maximum depth explored, using a hand auger.

3. **The discussion on page 3-23 suggests that the detection of high levels of lead and mercury are an isolated occurrence; yet samples SS-07 and SS-12 indicate high levels of lead. I realize the data has not been validated, but it appears to be premature to give the impression that there is no possible risk to construction workers.**

The highest detected concentration of mercury was 525 mg/kg, and this was detected in a single sample of flower-bed soil. Other detected concentrations of mercury ranged from 0.04 to 0.33 mg/kg. The source of the mercury in the flower-bed is unknown; it may have been brought in from another location.

The highest detected concentration of lead was 110 mg/kg. Other detected concentrations of lead ranged from 8.6 to 90 mg/kg. These lead concentrations are below 500 mg/kg, the value established by Office of Solid Waste and Emergency Response (OSWER) (9355.4-02) and FDEP's Department of Defense (DOD) cleanup goals for military sites as a reasonably safe value for a residential scenario.

Section 3.1.3

1. **The discussion on page 3-26 refers to a geophysical investigation in open spaces adjacent to the JSI Administration Bldg. This is not shown on Figure 3-17, but should include areas east, west and south of the Bldg.**

   Figure 3-11, not Figure 3-17, illustrates areas where the geophysical survey was likely to be unaffected by electrical power lines, metal fences, and underground utilities. A geophysical survey was not planned around the JSI Administration Building because of expected interference from electrical power lines, metal fences, and underground utilities. Geophysical surveys will be carried out in other areas around the JSI Administration building where these cultural features do not affect the results. Figure 3-11 will be amended to include these areas.

2. **Is it possible to extend the geophysical survey into the area where the drums of xylene were found? If possible this should be done.**

   The geophysical survey will include the area where the drums containing xylene were found, if practicable. The ability of the geophysical instrumentation to provide usable data is limited by the amount of electrical-magnetic interference and the amount of metallic material present at the WWTP. Figure 3-11 will be amended to include this area.

3. **I recommend extending the survey into the disturbed vegetation area (west and southwest) of SWMU 25 as shown on Figure 5.**

   The geophysical survey will include part of the parking-lot located next to SWMU 25. Both the text on page 3-26 and Figure 3-11 will be amended to include this area.

4. **No Terra-Probe locations are indicated in the areas of potential contamination in SWMUs 1,24,25,44, or 45; although 20 additional locations are to be determined in the field based on professional judgment. I recommend that areas for current and additional probe locations be selected by consensus, prior to field work, to ensure that all interested parties are satisfied. This is especially important since data from the probes will be used in selecting monitoring well locations.**

   Additional TerraProbe℠ sampling locations will be added to Figure 3-11 at SWMUs 1, 24, 25, 44, and 45. The purpose of the field screening is to collect samples for onsite analysis to determine appropriate locations for monitoring wells and to define the extent of contamination, if present, within the limits of the field screening methodology. The NAVSTA Mayport Partnering Team will determine the initial areas where the field screening will commence. However, the actual locations of field screening samples are made in the field as the data is collected. The NAVSTA Mayport Partnering Team will then evaluate the screening data and select monitoring well locations.

5. **No surface soil samples are initially planned for all of the areas of potential concern within the SWMUs. This is the time to collect samples and determine if contamination has occurred. I recommend that surface soil samples be taken at all locations of potential concern.**

Figure 3-12 will be amended to include an additional 12 surface soil samples at the potential source of contamination areas.

6. **The sampling and compositing procedure for the sludge drying beds is unclear. Will a composited sample from land surface to a depth of 1 foot for each quadrant be collected (equals 8 separate samples) and the same procedure for the 1 foot BLS to 2 feet BLS (equals 8 separate samples) be followed? What is the rationale for not collecting samples at a greater depth? (Comment 2, Section 3.1.2)**

The proposed procedure for collection of composite samples at the sludge drying bed will be clarified in the workplan. The following presents a summary of the sampling procedure:

Each quadrant of each sludge drying bed will have two composite samples collected, one composite from each of two distinct depth intervals. The first depth interval will be from the surface of the sludge drying bed to a depth of 1 foot bls; the second depth interval will be from 1 to 2 feet bls. In each quadrant, five individual samples from the same depth interval will be composited into a single sample. The five individual samples will form the pattern of a number 5 on dice, one in the center of each quadrant with one sample near each corner of the quadrant.

NAVSTA Mayport's WWTP is primarily a domestic sewage treatment plant. Sludge from the bed has been removed routinely. The initial sampling activity is intended to assess whether the sludge drying bed contains hazardous materials and/or may pose a threat to human health or the environment. Collection of additional samples will be based on analytical results. The sludge drying beds may be suitable for an interim measures removal action, and collection of additional samples would be part of this activity.

7. **Eight additional soil borings/samples are proposed after the evaluation of data gathered during this investigation. This may or may not be sufficient based on the initial results. The selected locations should be the result of consensus among partners.**

Concur. The actual number of additional samples will be based on analytical results and/or other information collected during the field investigation and agreed upon by the partnering team. However, for the Navy to contract services the number of samples has to be specified.

8. **The procedure for collection of soil samples from borings of monitoring wells should be the same as that used during other investigations at this facility. Deviation from the procedure would be reasonable if samples have been previously collected at the same location. One sample collected just above the water table will not be adequate.**

Previous investigative activities have included the collection of a subsurface soil sample from a 1-foot interval immediately above the water table. However, based on FDEP's concern, an additional sample will be collected and submitted for laboratory analysis if the water table is greater than 8 feet bls. The additional subsurface soil sample will be collected from a 1-foot interval that has the highest OVA measurement based upon field screening or, as a default, will be approximately halfway between the land surface and the water table.

9. **Seven borings are proposed at the JSI Bldg. Are these borings an extension of the Special Purpose Investigation previously conducted? Coordination between these activities should be resolved. If the borings are at new locations, a sample taken just above the groundwater level may not be sufficient.**

Sample locations around the JSI building are designed to determine whether this area was the location of the landfill as indicated by the RFA (A.T. Kearney, Inc., 1989).

Soil samples will be collected at the following intervals: from land surface to a depth of 1-foot bls, within a 1-foot interval immediately above the water table, and in areas where the water table is greater than 8 feet bls, a subsurface soil sample will be collected by the 1-foot interval that has the highest OVA measurement or, as a default, will be collected approximately halfway between the land surface and the water table. The data collected during the special purpose investigation will also be validated and used for the RFI.

10. **The proposed location of monitoring wells appears to be adequate for this phase of the investigation. However, I am concerned that wells or Terra-Probes (Comment 4 above) are not located in all areas of potential concern or SWMUs. Most certainly additional wells will be necessary, especially in source areas, to determine if the groundwater has been impacted. I recommend that at least one shallow monitoring well be installed at this time at SWMU 44.**

The proposed TerraProbe℠ field screening program will be used to select locations for monitoring wells. The field screening data will be presented to the NAVSTA Mayport Partnering Team so a consensus can be reached on the location of monitoring wells.

11. **Because the proposed sampling activities are shown on Figures which contain all of the SWMUs, it is difficult to determine if those activities are placed in the best position. I recommend that smaller scale maps for each SWMU be prepared so as to best evaluate proposed sampling locations.**

NOTE: The selected list of contaminants for analysis should be discussed to ensure that all regulatory requirements are being met.

The SWMUs were grouped, and are proposed to be assessed, together because they are adjacent sites that share a similar topography and have similar contaminants. The groundwater beneath the SWMUs is continuous, and the impact of individual SWMUs would be impossible to determine. Smaller scale maps would not illustrate the interrelation of the SWMUs and sampling locations.

Note. The proposed list of target analytes is provided in Tables 4-1 through 4-5.

SWMUs 14 and 18

Section 3.2

1. **How frequently is the fire training area used? Based on a site drive-by; there appears to be the potential for a release of possible contaminants to the environment every time the facility is used; especially from the circular burn pads through concrete cracks/joints. Are there any plans to eliminate this possibility in the near future?**

   The existing FFT area illustrated in Figure 3-17 is an active training facility and is used several times a week. The Navy plans to decommission this FFT area in late 1995 and convert it to a parking lot.

   FFT wastes are collected in a drainage system designed to retain the liquid generated. The purpose of the RFI at this SWMU is to assess whether there has been a release of contaminants to the environment, and to design appropriate remedial measures to mitigate any releases and reduce or eliminate threats to human health and the environment.

   The recently constructed FFT area is undergoing a 1-year period of system evaluation. After the system has been demonstrated to perform in accordance with specifications, the facility will be turned over to the Navy. The Navy anticipates having the new FFT facility in full operation by the fourth quarter of 1995.

Section 3.2.1

1. **Additional investigation is needed regarding the disposal of materials during modification activities at the FFT, and all of the drums containing mercury waste.**

   The Navy will continue to seek information regarding the drums that reportedly contained mercuric nitrate.

2. **Figure 3-20 indicates the presence of an oil/water separator and that the piping/drainage system may still discharge to the tidal pool area. Please elaborate. If this system still drains to the tidal area, then corrective actions to eliminate this situation should be begun immediately.**

   The retention pond has an emergency overflow pipe that formerly discharged to the tidal pool. NAVSTA Mayport personnel indicate that this discharge pipe has become clogged with debris (sand and shell fragments) and no longer discharges to the tidal pool. NAVSTA Mayport personnel routinely check the tidal pool area to verify that a release has not occurred. The Navy acknowledges its duty to prevent a discharge of FFT waste from this area and, as previously

stated, is currently constructing a new facility that should be operational in 1995. The original FFT facility will be decommissioned and will be used as a parking lot.

Section 3.2.2

1. **Analytical results from a previous investigation are briefly discussed. The complete results or tabular summary of those results should be included in the Workplan. Have the monitoring wells been sampled and analyses performed since the original investigation?**

   Available analytical data from previous investigations has been included in the RFI workplan addendum. With the exception of monitoring well MPT-1-1 at SWMU 1, none of the other monitoring wells in Group III SWMUs have been sampled since 1988.

Section 3.2.3

1. **PCBs and pesticides should be included as probable contaminants because of past practices at fire training areas and the reported presence of PCBs and pesticides in soil samples found during a previous investigation at this site.**

   The proposed list of target analytes was provided in Tables 4-1 through 4-5. Pesticide and PCB target analytes are included in Tables 4-1 and 4-4.

2. **Sixteen TerraProbe℠ locations are proposed and samples to be collected for the purpose of locating monitoring wells. Many of the TerraProbe℠ locations appear to be adjacent to already proposed (9) monitoring wells. I suggest this proposal be reviewed and modified to include locations within the suspected mercury release area, adjacent to fire training areas, and in the wastewater overflow path as described in paragraph 3, page 3-41. The collection of surface soil samples is planned within the mercury storage area by coring or boring through the concrete; at that time TerraProbe℠ activities could also take place.**

   The purpose of the TerraProbe℠ is to collect groundwater samples to provide field screening data that will be used to locate monitoring wells. It is probable that some of the monitoring wells may be located adjacent to TerraProbe℠ sampling locations.

   Groundwater samples collected with a TerraProbe℠ typically are turbid and not suitable for analyses of inorganic analytes. Therefore, it is not proposed to use a TerraProbe℠ to collect groundwater samples from the mercury storage area.

3. **Sediment and soil samples should be taken in the wastewater overflow path described in paragraph 3, page 3-41. Subsurface samples may also be necessary to confirm or eliminate the possibility of contamination.**

Environmental samples proposed in the drainage path described in paragraph 3, page 3-41, include three TerraProbe℠ and three sediment sampling locations (Figure 3-21). SWMU 18 is also in this same stormwater drainage ditch system.

Agree: if either sediment or TerraProbe℠ samples contain concentrations of contaminants, then subsurface soil sample locations will be warranted.

4. **The collection of one subsurface soil sample just above the water table per monitoring well is insufficient. Additional samples should be collected for analysis at 0 to 1 foot BLS and at the highest OVA measurement. As a default to the OVA measurement a sample should be collected at 3 to 4 feet BLS. The 0 to 1 foot sample may be eliminated if the monitoring well is located adjacent to a surface soil sample location.**

See the response to comment 8 for Section 3.1.3.

SWMU 17

Section 3.3.1

1. **The most recent test data for both wet and fly ash, as well as the EP Tox data discussed in this section should be provided in the Workplan.**

Analytical results for the last disposal of wet and fly ash will be included in the report.

Section 3.3.3

1. **This section describes the presence of ash material during a previous investigation on the north side of the Boiler Bldg. No sampling activities of any type are proposed in this area. The type of sampling activity for this area should be discussed and agreed upon by all interested parties.**

Soil sampling was not proposed for this area because it is paved, as is the NAVSTA Mayport Transportation Garage area located to the north of SWMU 17. However, a surface soil sample (1-foot interval beneath the pavement) will be collected at the location of monitoring well MPT-17-MW3, which is to be located at the northwestern corner of the site. The location of monitoring well MPT-17-MW3 is topographically lower than the paved areas of SWMU 17 to the west and south.

2. **Presumably groundwater flow is to the north toward the Turning Basin. Because the ash material failed EP Tox testing, a groundwater monitoring well should be installed on the north side of the building. Soil samples should be collected for analysis as the well is installed.**

Figure 3-22 will be amended to illustrate proposed locations for three monitoring wells.

RFI FDEP Natural Resource Trustee

1. **Based upon the likely groundwater flow at this group of SWMUs, we recommend another monitoring well cluster be placed downgradient and between the two northernmost well clusters currently shown on Figure 3-13. The other wells are located at the outer northeast and northwest edge of the SWMU grouping and may miss any contamination which could likely migrate between them.**

Currently, there is an insufficient number of monitoring wells in the Group III area to determine groundwater flow direction, which was the rationale for the locations illustrated in Figure 3-13. The second paragraph on page 3-13 explained that five additional monitoring wells were to be located, based upon geophysical survey and field screening data. Potential locations for the additional wells were not included in Figure 3-13. However, because there is a wide gap between monitoring wells proposed on the northern boundary, this area is likely hydraulically downgradient of the Group III SWMUs, an additional shallow and intermediate well pair will be included in the RFI workplan on Figure 3-13. This monitoring well cluster will be located northwest of the wastewater treatment plant.

2. **Also, for us to adequately comment in the future, please submit to us copies of the RFI Addenda 1, 2, 3, and 4, and a copy of the Technical Memorandum Background Characterization Activities RCRA Facility Investigation, NAVSTA Mayport, Florida (ABB-ES, 1994b).**

As discussed on September 1, 1994, at the NAVSTA Mayport Partnering Meeting, FDEP has been provided with copies of these documents and the FDEP Natural Resource Trustee will obtain one of the copies for review. Additionally, in the future the FDEP Natural Resource Trustee will be provided with a copy of documents.

REFERENCES

ABB Environmental Services, Inc., (ABB-ES), 1992, Addenda 1, 2, and 3 Investigation Derived Waste Management Plan, Phase 2 Background Sampling and Analysis Plan and Light Nonaqueous Phase Liquid (LNAPL) Sampling and Analysis Plan, U.S. Naval Station Mayport, Mayport, Florida: prepared for SOUTHNAVFACENGCOM, Charleston, South Carolina.

ABB-ES, 1994a, Special-Purpose Investigation Former Jacksonville Shipyard Administration Building, U.S. Naval Station Mayport, Mayport, Florida: prepared for SOUTHNAVFACENGCOM, Charleston, South Carolina, January.

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